SONY

TIME LAPSE VIDEOCASSETTE RECORDER

SVT-RA40
SVT-RA168

COMPUTER INTRFACE BOARD

SVT-RS100

SERVICE MANUAL

1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreskrifter.

VAROITUS

Paristo voi räjähtää jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

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Manual Structure

Purpose of this manual

This manual is the Service Manual for the time lapse videocassette recorder SVT-RA40/RA168 and the option board Computer Interface Board SVT-RS100. This service manual provides the information of maintenance and detailed service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list).

Related manuals

In addition to this Service Manual, the following manuals are provided.

- **Operating Instructions**
  SVT-RA40 (Supplied with Model SVT-RA40)
  Part number: 3-206-678-XX

  SVT-RA168 (Supplied with Model SVT-RA168)
  Part number: 3-206-574-XX

  SVT-RS100 (Supplied with Model SVT-RS100)
  Part number: 3-206-934-XX

Contents

This service manual is organized by following sections.

Section 1 Service Overview
Describes the information that is required to service (maintenance table on the monitor screen, removal of cabinet, mechanism unit and main board, circuit board locations, etc.).

Section 2 Mechanical Adjustments
Describes the recommended periodic maintenance, the cleaning procedure, service tools, disassembling the main parts of the mechanism and tape path adjustment.

Section 3 Electrical Adjustments
Describes the electrical alignment for the maintenance of this unit.

Section 4 Spare Parts
Describes the exploded views, the mechanical parts list and the electrical parts list.

Section 5 Semiconductors
Describes information on semiconductors used for unit.

Section 6 Block Diagrams
Describes the overall wiring and the block diagrams of each board.

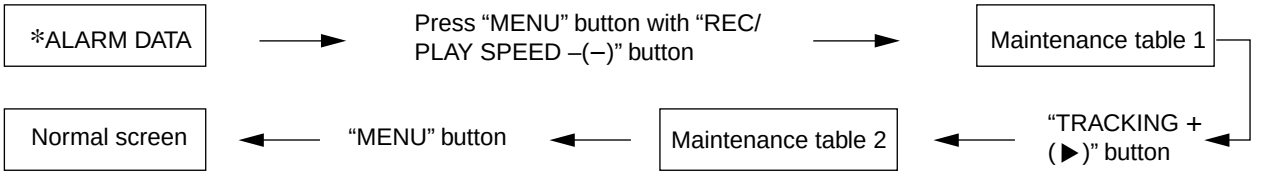
Section 7 Schematic Diagrams
Describes the schematic diagrams for the unit.

Section 8 Board Layouts
Describes the board layouts for the unit.

Section 1
Service Overview

1-1. Maintenance Table on the Monitor Screen

To display the maintenance table, press "MENU" button with "REC/PLAY SPEED −(−)" button while the fourth MENU <ALARM TIME> is displayed.



Maintenance table 1

The used time of each mode (part) is displayed, and can be reset by items.

Access the maintenance-screen according to the above, and then Fig. below is displayed and VIDEO HEAD will blink.

Move the blinking to the item to be reset with "TRACKING – (▼) " button and press the "MENU RESET" button, and then the used time for the item will be reset.

< MAINTENANCE TABLE 1 >

USED TIME RESET

*VIDEO HEAD	0 0 0 0 0 H
*POWER ON	0 0 0 0 0 H
*ALARM DATA	0 0 0 0 0 0

NEXT TABLE : ▶

When the "MENU RESET" button is pressed during display and resetting all data.

VIDEO HEAD: Used time of the video head (cylinder) total hours.

Note

Reset when the cylinder is replaced.

POWER ON: Hours of the power supply being.

ALARM DATA: Number of ALARM REC.
Total counts of ALARM.

Note

The data for the maintenance tables are memoried in E^2 PROM, and the memory can be kept if the timer micro-computer is reset.

Maintenance table 2

As shown in Fig. below Maintenance Table 2, <ERROR> is displayed on the screen.

< MAINTENANCE TABLE 2 >

ERROR

	DATE	CODE	POSITION
1	06 - 26 - 02	E01	08
2	- - - - - - - - -	- - -	- -
3	- - - - - - - - -	- - -	- -
4	- - - - - - - - -	- - -	- -
5	- - - - - - - - -	- - -	- -
6	- - - - - - - - -	- - -	- -
7	- - - - - - - - -	- - -	- -
8	- - - - - - - - -	- - -	- -

When the "MENU RESET" button is pressed during display and resetting all data.

<ERROR> : Dates and error codes are displayed when VCR happens to be in an abnormal condition and the system is down.
The newest data is displayed in the first line, and the old ones are moved down one by one.
Not-displayed old data is cleared automatically.

Error Codes (Self-Diagnosis Contents)

No.	Problem	Mechanism Operations and State After Occurrence
E01	The cylinder does not rotate. The tape winds around the cylinder.	Shift to the STOP mode. Unload forcibly.
E02	The take-up reel does not rotate.	Shift to the STOP mode.
E03	The capstan motor does not rotate.	Shift to the STOP mode.
E04	The tape can not be loaded. (But unloading can be performed.)	Unload, shift to the ST-BY mode, and the power goes off.
E05	The tape can be loaded with the cassette inserted. But unloading can not be performed or the loading and unloading cannot be performed with the cassette inserted. (The tape guide is caught.)	The power is forcibly turned off with the mechanism at its current position.
E06	Front unloading cannot be performed when ejecting the cassette. (Front loading can be performed.)	Front loading, shift to the STOP mode or ST-BY mode.
E07	Front loading and front unloading cannot be performed when ejecting the cassette. (The cassette is caught in the mechanism front.)	The power is forcibly turned off with the mechanism at its current position.
E09	The mechanism becomes 7 (INITIAL) while moving from 1 (BRAKE), 2 (STOP), 3 (PLAY), 4 (STILL/SLOW), and to 5 (REVERSE FRAME ADVANCE). (The mechanism mode switch is faulty.)	Carry out the tape take-up operations, and shift to STOP mode.
E10	The capstan motor does not rotate, or the capstan motor and the cylinder motor does not rotate with the cassette inserted.	Shift to the EJECT mode.
E11	The cylinder motor does not rotate with the cassette inserted.	Shift to the EJECT mode.
E12	The supply reel does the tape eject when tape unloading.	Shift to the EJECT mode.
E13	The tape cannot be loaded with the cassette inserted.	Shift to the EJECT mode.
E14	The tape cannot be loaded normally.	Shift to the EJECT mode.
E15	The mechanism does not move to the correct position after tape loading.	The power is forcibly turned off with the mechanism at its current position.
E16	Mechanism position “3” cannot be used during intermittent recording.	Shift to the STOP mode.

Mechanism Mode Display Contents

Mode. No.	Mechanism mode	Mode. No.	Mechanism mode	Mode. No.	Mechanism mode
00	CASSETTE OUT	09	REC	32	INTERMITTENT REC
01	STAND-BY	12	CUE	33	REVERSE STILL
02	STOP	13	REVIEW		
03	STILL	14	FAST FORWARD		
04	REC-PAUSE	15	REWIND		
06	FRAME ADVANCE	30	REVERSE PLAY		
08	PLAY	31	REVERSE FRAME ADVANCE		

1-2. Removal of Cabinet, Mechanism Unit, and Main Board

1-2-1. Removing the Cabinet Parts

1. Remove the cabinet and bottom cover by removing the four screws (1) and five screws (2).
2. Remove the front panel by removing the locks of the clamps (A) using a screwdriver, etc. and slightly rotating the bottom part in the direction of the arrow.

Notes

- Electrical adjustments for the this model can be performed with only the cabinet removed.
- When replacing the bottom cover, do not tighten the screws (2) too much. Excess tightness may damage the screws taps on the chassis.

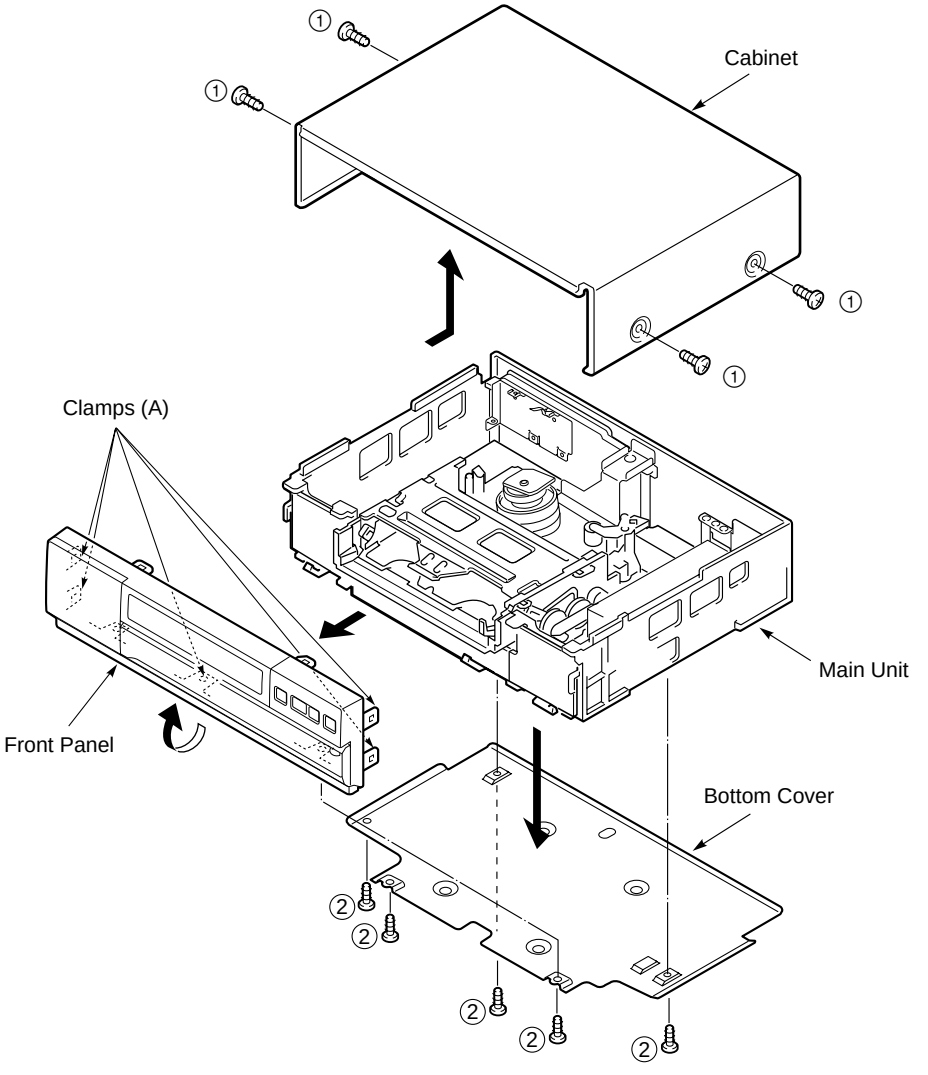


Fig. 1-1-1

1-2-2. Removing the Mechanism Main Unit and the CP-1 PWB Assembly

1. Spread out the lock clamps (B) and (C) in the arrow direction slightly and remove the TM-1 PWB and TM-2 PWB as shown in Fig. 1-1-2.
2. Remove the screws (3), (4) and (5) at the chassis.
3. Remove the screw (6) at the PW-1 PWB.
4. Remove the two screws (7) at the CP-1 board.
5. Remove the two screws (8) of the mechanism unit. The two screws (8) of the cassette tray can be removed easily by pushing the tray lock lever in the arrow direction to remove the lock as shown in the enlarge view A and by pushing the lid opener lever in the arrow direction to remove the lock as shown in the enlarge view B.
6. Lift up the whole mechanism unit and main board (CP-1 PWB assembly), and as shown in Fig. 1-1-3, push the two lock clamps (D) of the chassis in the arrow direction so that they can be removed from the chassis.

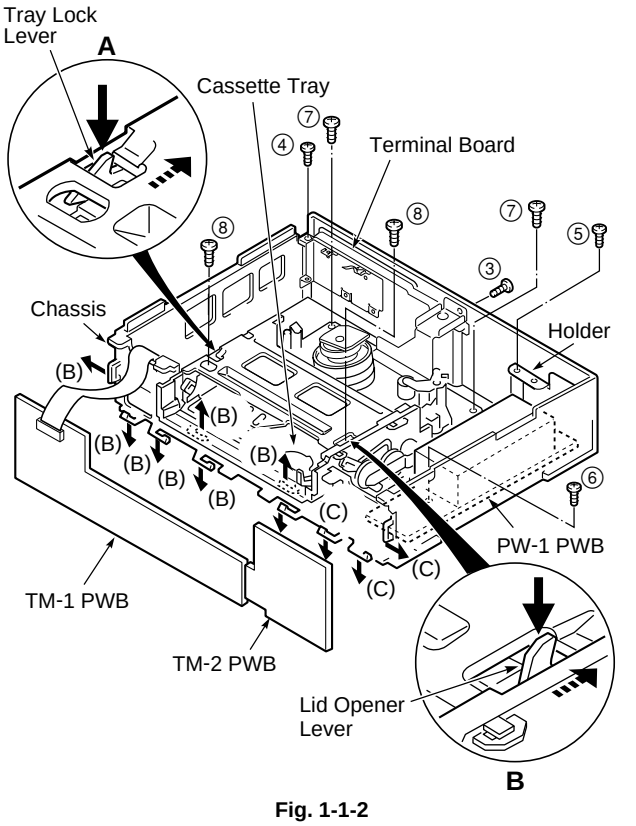


Fig. 1-1-2

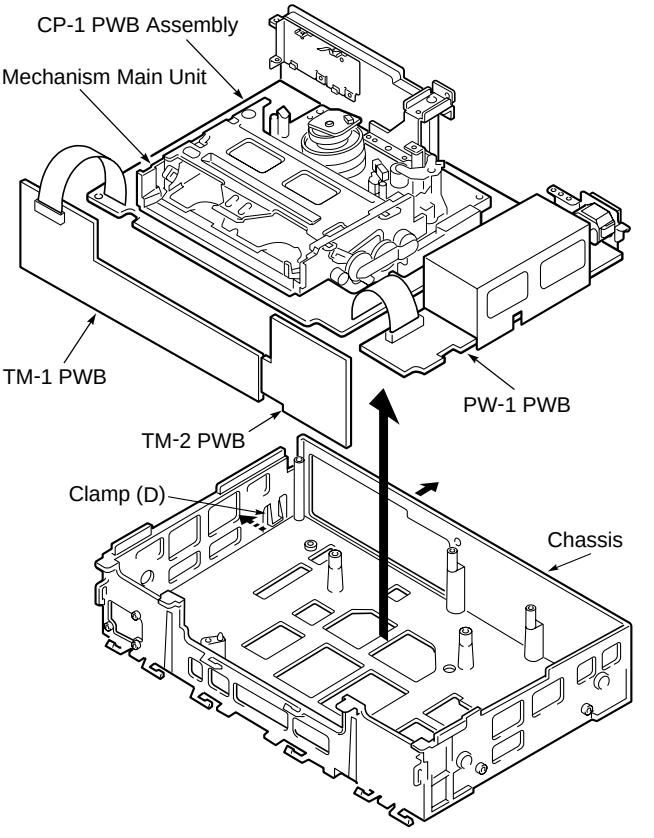


Fig. 1-1-3

1-3. Temporarily Setting Up and Connecting CP-1 PWB Assembly

The following is an example of how to place and connect the main board without a jig, when repairing the CP-1 PWB assembly.

1. Place the mechanism unit and main board up side down as a whole on a flat surface with foil side of the main board facing up.
2. Operete the unit using the buttons on TM-1 PWB and TM-2 PWB.

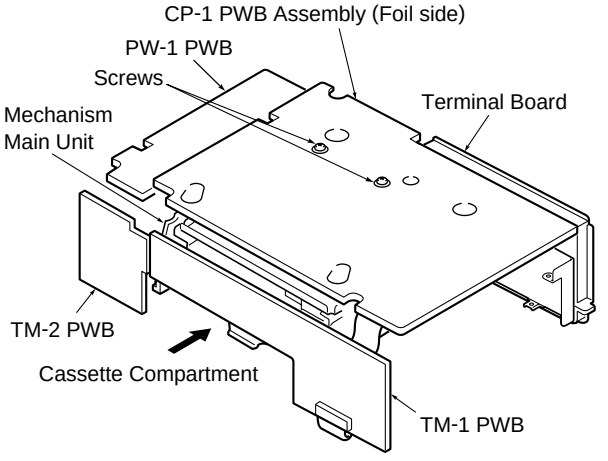


Fig. 1-1-4

1-4. Installation of the Front Panel

When installing the front panel to the chassis after repaires and adjustments.

1. Pressing down the door opener lever of the mechanism main unit.
2. Set the cassette door to half-opened state as shown in Fig. 1-1-5, and install the front panel to the chassis.

Note

Opened cassette door position does not install the front panel to the chassis.

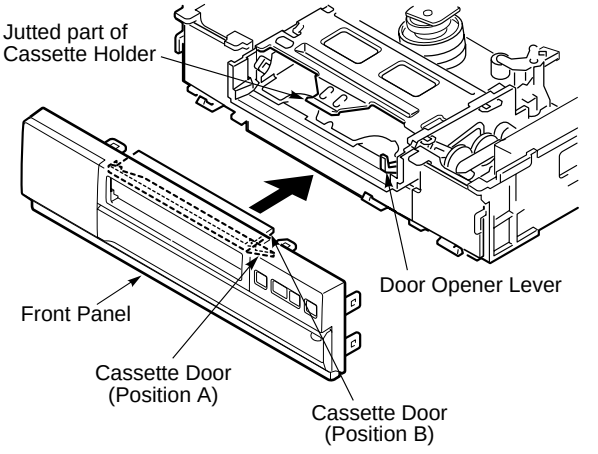
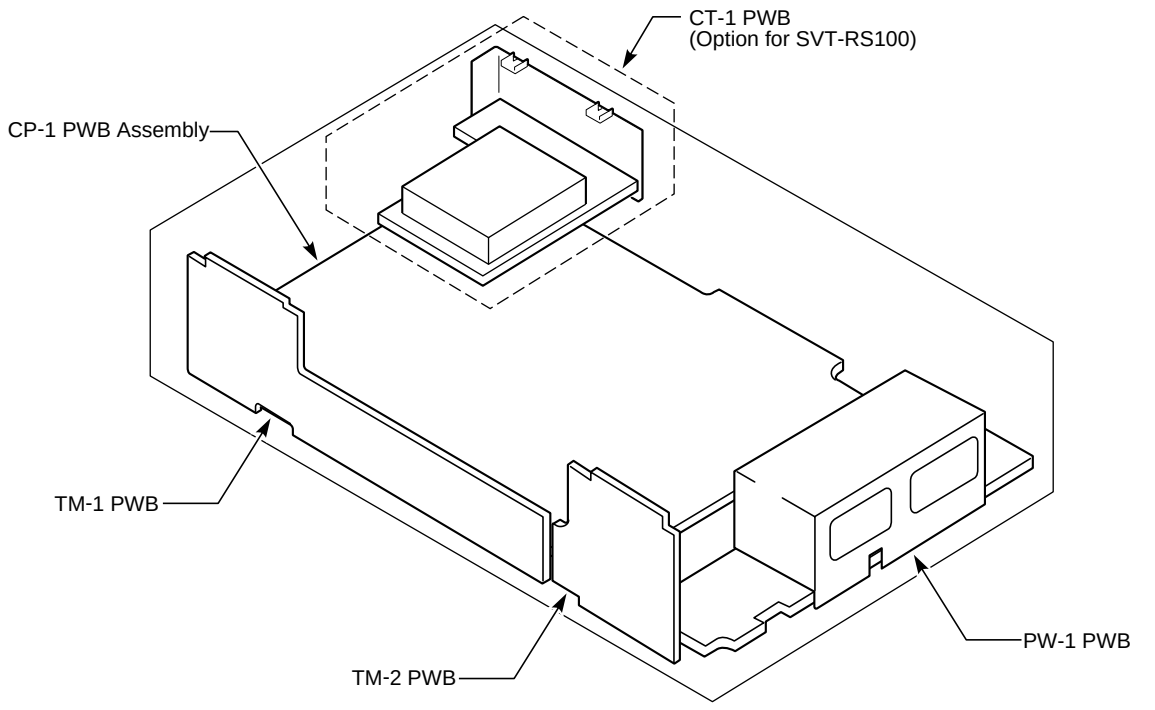


Fig. 1-1-5

1-5. Circuit Board Locations



1-6. Lithium Battery for Backup

This unit is equipped with a backup battery(lithium battery) to maintain the clock settings.
For replacement, be sure to use the specified part.

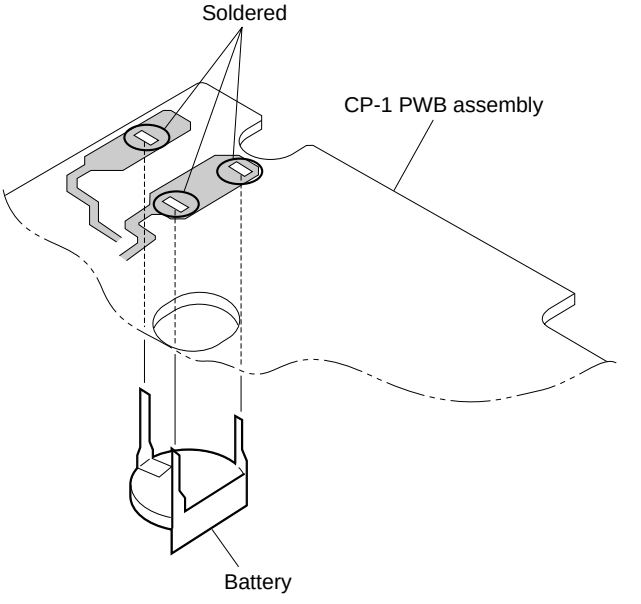
Replacement part: Z3901/CP-1 board
Part description: MnO2-Li (lithium battery)
Part No.: 1-756-091-11

Replacement

1. Remove the cabinet and bottom cover. (Refer to Section 1-2-1.Removing the Cabinet Parts)

2. Place the mechanism unit and CP-1 board up side down as a whole on a flat surface with foil side of the CP-1 board facing up. (Refer to Section 1-3.Temporarily Setting Up and Connecting CP-1 PWB Assembly)

3. Unsolder the leads of the battery from the soldering side of the CP-1 board and remove the battery. Solder the backup battery in the reverse procedure of removal.



Section 2
Mechanical Adjustments

1. Maintaining and Checking the Mechanism

1-1. Regular Checks and Maintenance Items

To obtain full function and maximum performance from the set, and to stop it getting dirty or scratched, we recommend that you carry out the following maintenance procedures and regular checks. The maintenance checks described in the following section should also be carried out without fail after carrying out any repairs to the set.

Note: Oil and Grease

- Always use the specified brands of oil and grease. If you use a grease with the wrong viscosity, for example, this can lead to all sorts of problems. Be careful to keep the oil and grease free of dust and foreign bodies.
- A “drop” of oil is the amount of oil remaining on the tip of a rod with a diameter of 1. 5 mm after it is dipped in oil to a depth of 1 cm and then taken out.

1-1-1. Regular Checks

○ Cleaning ◎ Check △ Oil □ Check, Replace

Part maintained		Part Number	Hours of use (H)				Remarks
			2000	4000	6000	8000	
Tape path system	Band brake assembly	3-963-789-01	◎	□	◎	□	
	BT lever assembly	3-961-016-01	○	○	○	○	
	Full erase head	3-193-669-01	○	○	○	□	
	Cleaner roller assembly	3-977-067-01	◎	□	◎	□	
	Guide roller assembly	3-735-630-01	○	○	○	○	
	S incline mounting assembly	3-961-037-01	○	○	○	□	
	T incline mounting assembly	3-961-039-01	○	○	○	□	
	ACE head	A-8344-338-A	○	○	○	□	
	Pinch roller lever assembly	3-961-024-01	○	□	○	□	
	Pinch lift mounting	3-204-110-01				□	
	Pinch lift cam	3-961-027-01				□	
	Pinch cam gear	3-203-303-01				□	
	Cylinder chip earth	3-206-679-01		□		□	
	Cylinder complete	A-8344-339-A	○	○(□)	○	○(□)	
	Upper cylinder assembly	3-206-564-01	○(□)	○(□)	○(□)	○(□)	
Reel drive system	Supply reel assembly	3-977-065-01	○ △	○ △	○ △	○ △	
	Take up reel assembly	3-963-782-01	○ △	○ △	○ △	○ △	
	S reel gear	3-960-927-01	△	△	△	△	
	T reel gear	3-960-928-01	△	△	△	△	
	Reel pulley	3-960-926-01	△	△	△	△	
	Special washer 2.4 × 6 × 0.25	3-948-603-01		◎		◎	
	Clutch mounting complete	A-8316-756-A	△	□	△	□	
	Reel belt	3-960-929-01	□	□		□	
	Capstan motor	3-203-331-01	○	◎(□)	◎(□)	□	
	Friction gear assembly	3-206-566-01	△	△ □	△	△ □	
Brake system	S brake assembly	A-8325-366-A	◎	◎	◎	◎	
	T brake assembly	A-8325-367-A	◎	◎	◎	◎	
	Capstan brake assembly	A-8315-818-A	◎	◎	◎	◎	
	T soft brake assembly	3-963-784-01		◎		□	
Loading drive system	Loading motor assembly	3-961-047-01		◎		□	
	Damper	3-961-049-01				□	
	Worm gear complete	3-961-048-02		◎		□	
	Main cam	3-206-567-01				□	
	Special washer 3.6 × 0.5	3-973-491-01		◎		□	
	Wheel gear 1	3-961-050-01				□	
	Wheel gear 2	3-963-793-01		◎		□	
	Opt pinch relay gear	3-206-568-01				□	
	Crescent slide	3-203-305-01		◎		□	
	S load gear	3-960-995-01		◎		□	
	Front rack gear	3-961-305-01		◎		□	
	Start rack gear	3-961-306-01		◎		□	
	Pinion gear	3-960-960-01		◎		□	
Perform-ance checks	Back tension torque			◎	◎	◎	PB back tension torque: 25~50 g•cm
	FF, REW torque			◎	◎	◎	FF, REW: more than 600 g•cm
	PLAY torque			◎	◎	◎	PLAY: 55~110 g•cm
	REV torque			◎	◎	◎	REVIEW: 100~210 g•cm

This periodic maintenance check table changes considerably according to the using conditions and environment.
This is an annual periodic maintenance check table. Repeat this maintenance table every year.
As life may be shortened if foreign particles and dusts remain accumulated on the tape guides and rotating and contacting portions, clean if dirty.
Dusts and other foreign particles on the tape guides may also shorten the tape life and lower picture quality, therefore clean thoroughly.

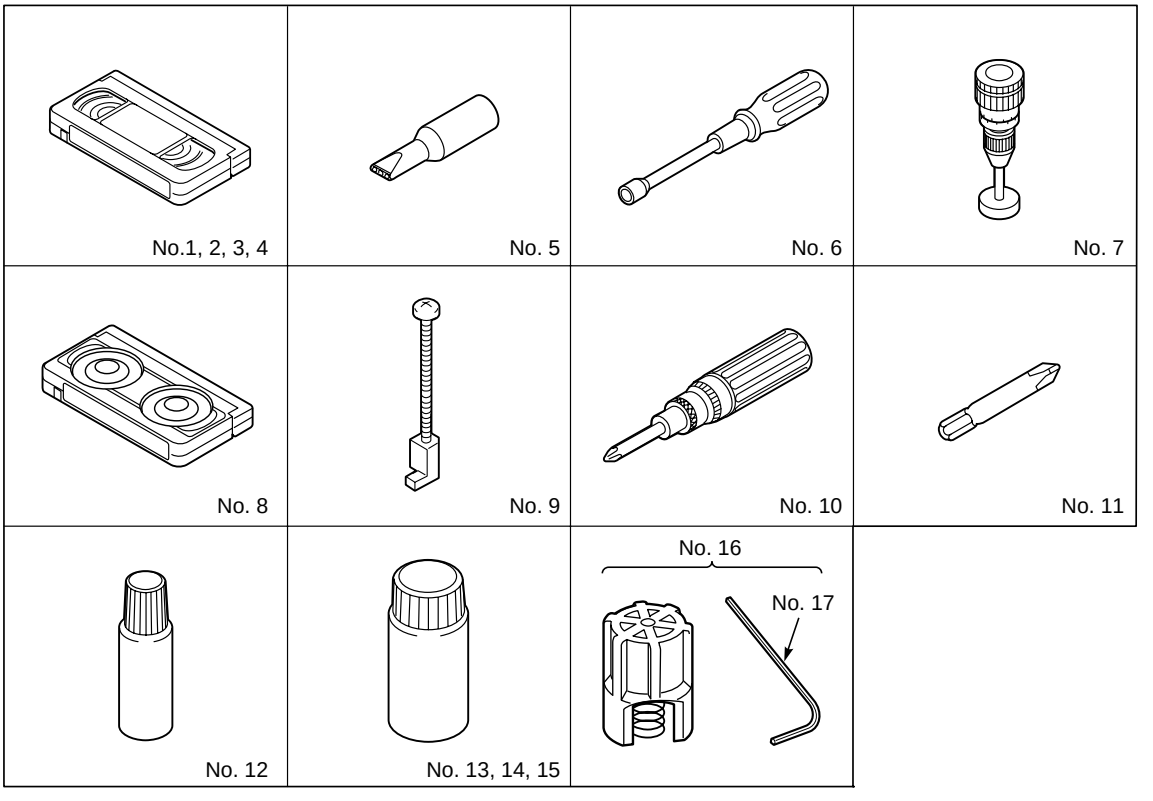
1-2. Service Tools and Cleaning

1-2-1. Service Tools

Notes on Alignment Tapes

Alignment tape from the list below, according to the transmission system of the VCR you are repairing.
Models with 525 scanning lines and a field frequency of 60Hz

No.	Tool	Tool No.	Remarks
1	Alignment tape (VHJ-0005)	————————	SP colour bar 1 kHz (normal)
2	Alignment tape (VHJ-0006)	————————	SP monoscope 7 kHz or 6 kHz (normal)
3	Alignment tape (VHJ-0007)	————————	EP monoscope No Audio signal
4	Alignment tape (VSJ-1001)	————————	EP Sync signal 3 kHz (normal)
5	Eccentric screw driver (VHJ-0003)	J-6082-044-A	Used to adjust the tape path
6	Nut box (VHJ-0048)	J-6082-045-A	Used to adjust the height of the lever load assembly
7	Torque dial gauge (VHJ-0004)	————————	Used to measure reel winding torque
8	Cassette torque meter (VHJ-0016)	————————	Used to measure back tension torque
9	Load lever assembly height adjustment tool (VHJ-0111)	J-6431-410-A	Used to adjust the height of the load lever assembly
10	Torque gauge screwdriver (VHJ-0014)	J-6082-047-A	Used to adjust the tightening torque of screws
11	3 mm dia. bit for torque screwdriver (VHJ-0045)	J-6082-048-A	Used to replace the bit of the torque gauge screwdriver
12	Oil (VHJ-0099)	7-661-018-18	————————
13	Grease (VHJ-0100)	7-661-000-11	————————
14	Grease (VHJ-0101)	J-6090-014-A	————————
15	Grease (VHJ-0114)	————————	————————
16	Upper drum fitting tool kit (VHJ-0112) (includes VHJ-0113)	————————	Used to reassemble the upper cylinder
17	Hexagonal wrench (VHJ-0113)	————————	Spare hexagonal wrench for upper drum fitting tool kit



1-2-2. Cleaning

1. Cylinder (Drum)

Moisten a chamois with methyl alcohol and clean the video head and the tape path surface of the cylinder. Be sure to wipe horizontally in relation to the video head. If you wipe vertically, or use excessive force, you can damage the video head.

2. Tape Path System / Reel Drive System

Clean the pinch roller, the capstan shaft, the tape guides, the FE head, the ACE head, the reel table, the pulley and the reel belt with a soft cloth, or chamois, moistened with methyl alcohol.

Note

If the dirt on the tape guide cannot be cleaned off, replace the tape guide.

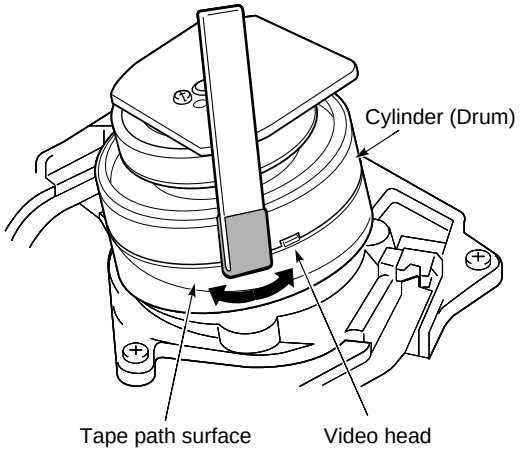


Fig. 1-2-2

2. An Overview of the Mechanism

2-1. Names of the Main Parts

2-1-1. Cassette Mechanism Assembly

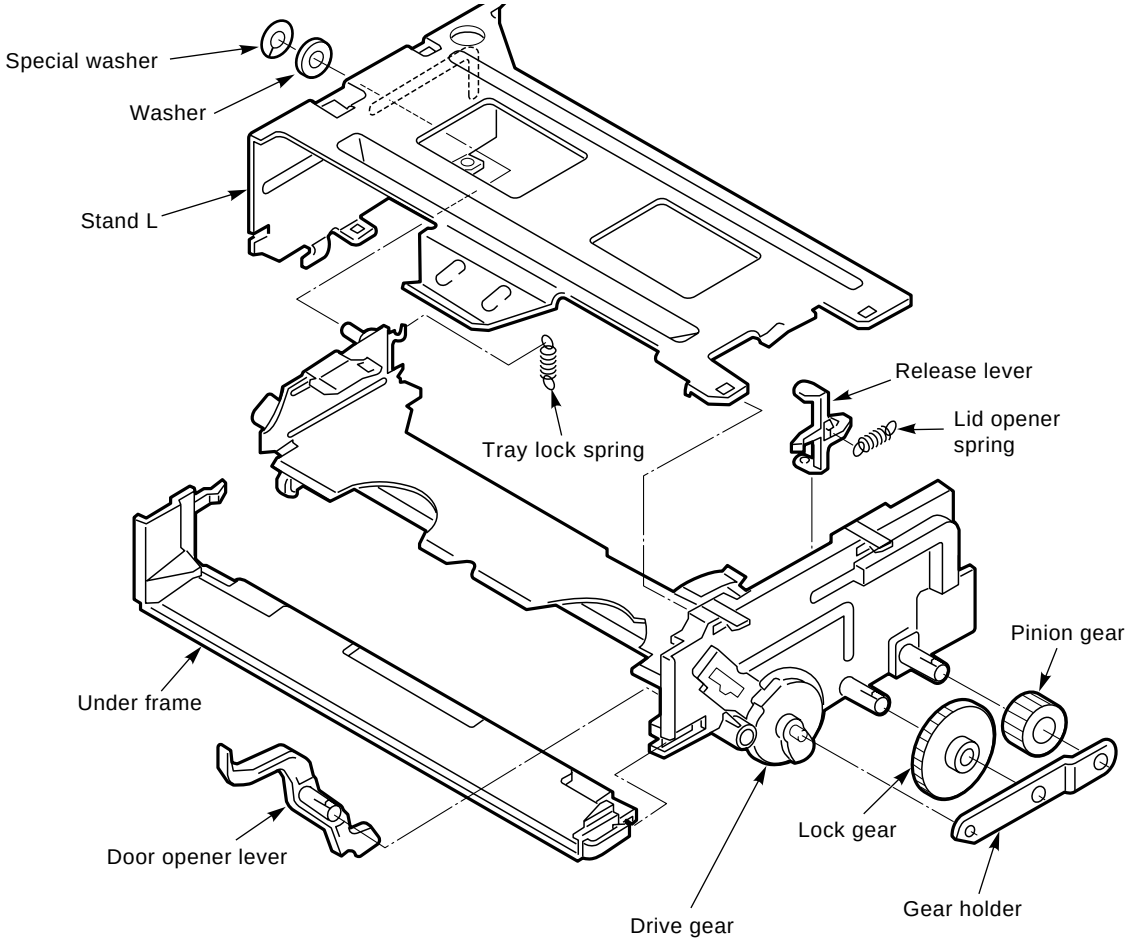


Fig. 2-1-1

Fig. 2-1-1

2-1-2. Topview

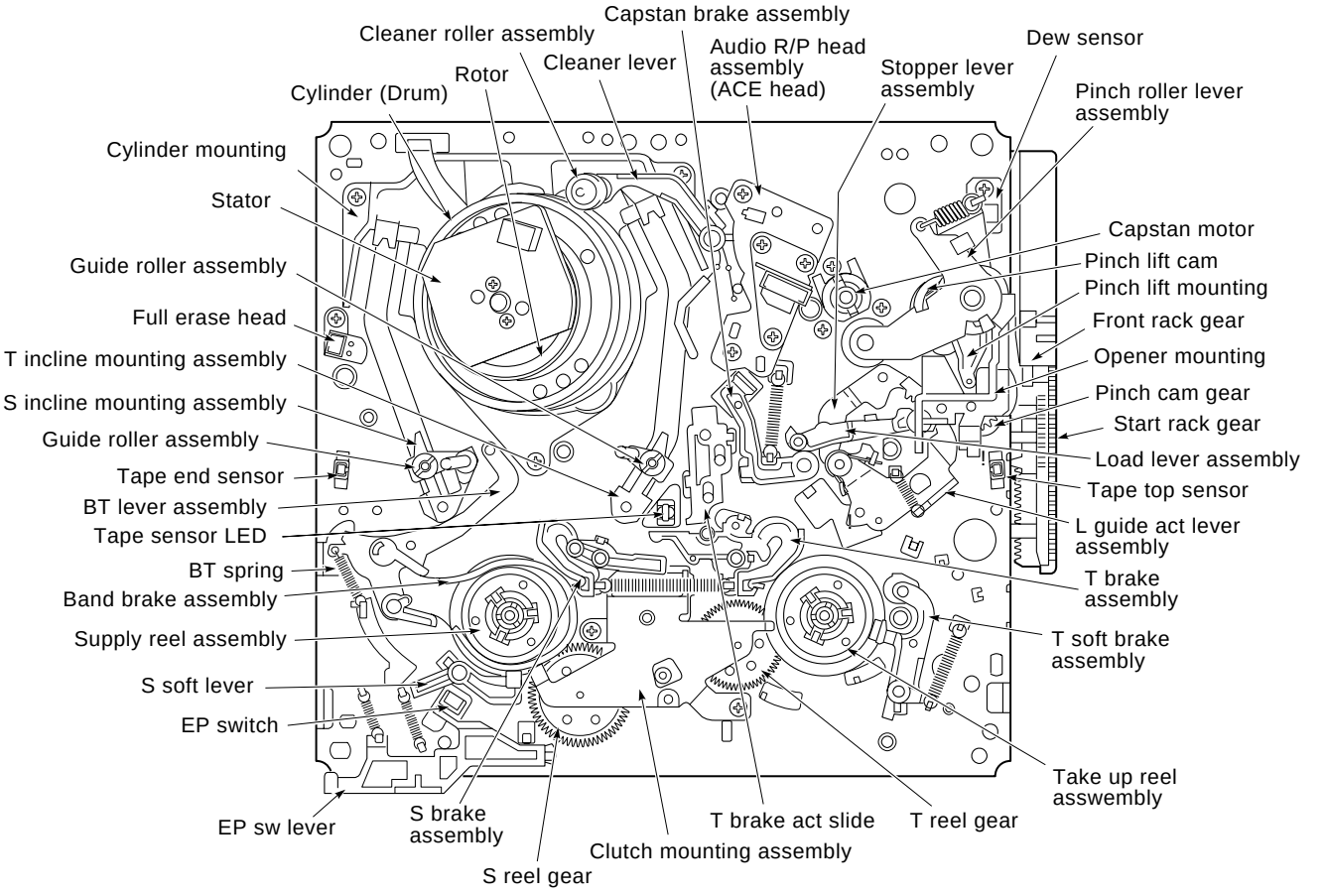


Fig. 2-1-2

2-1-3. Underside

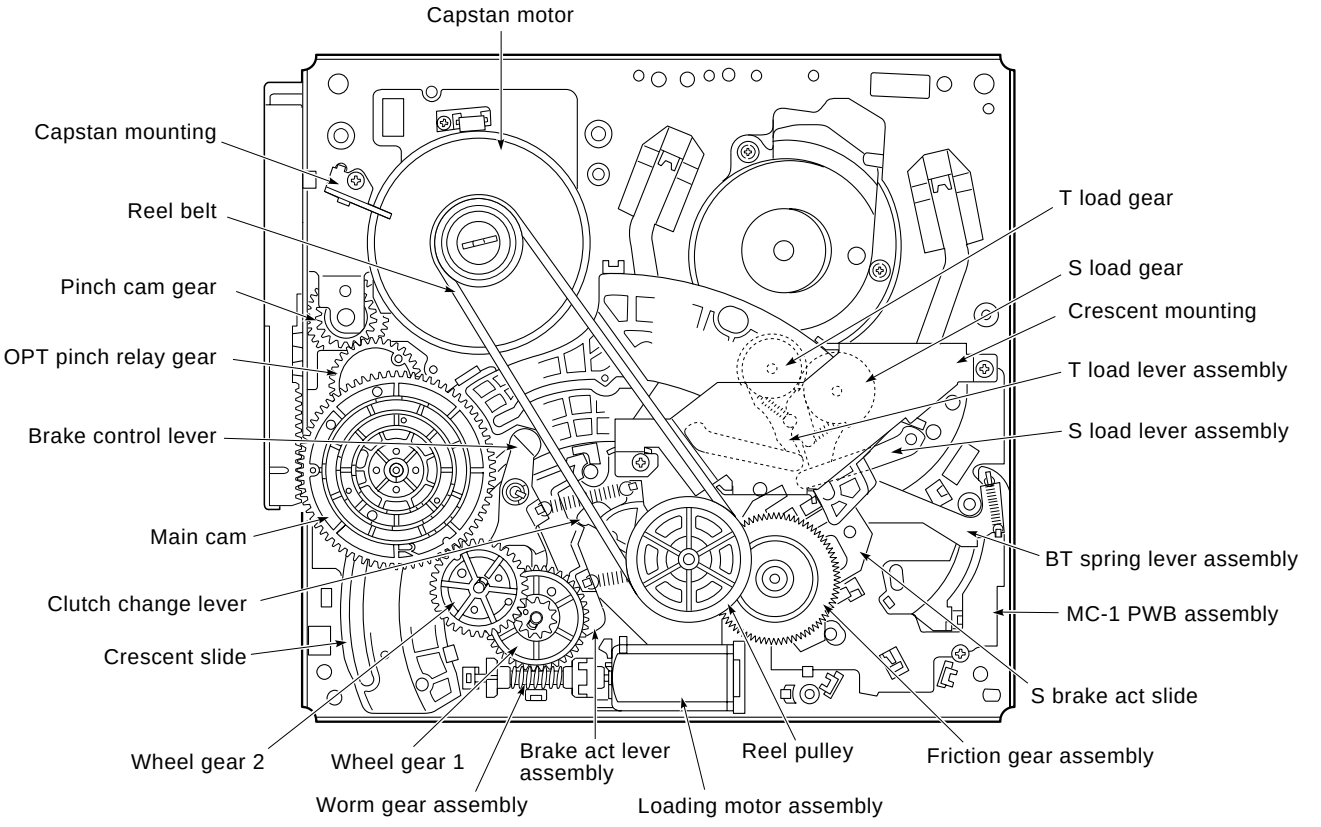


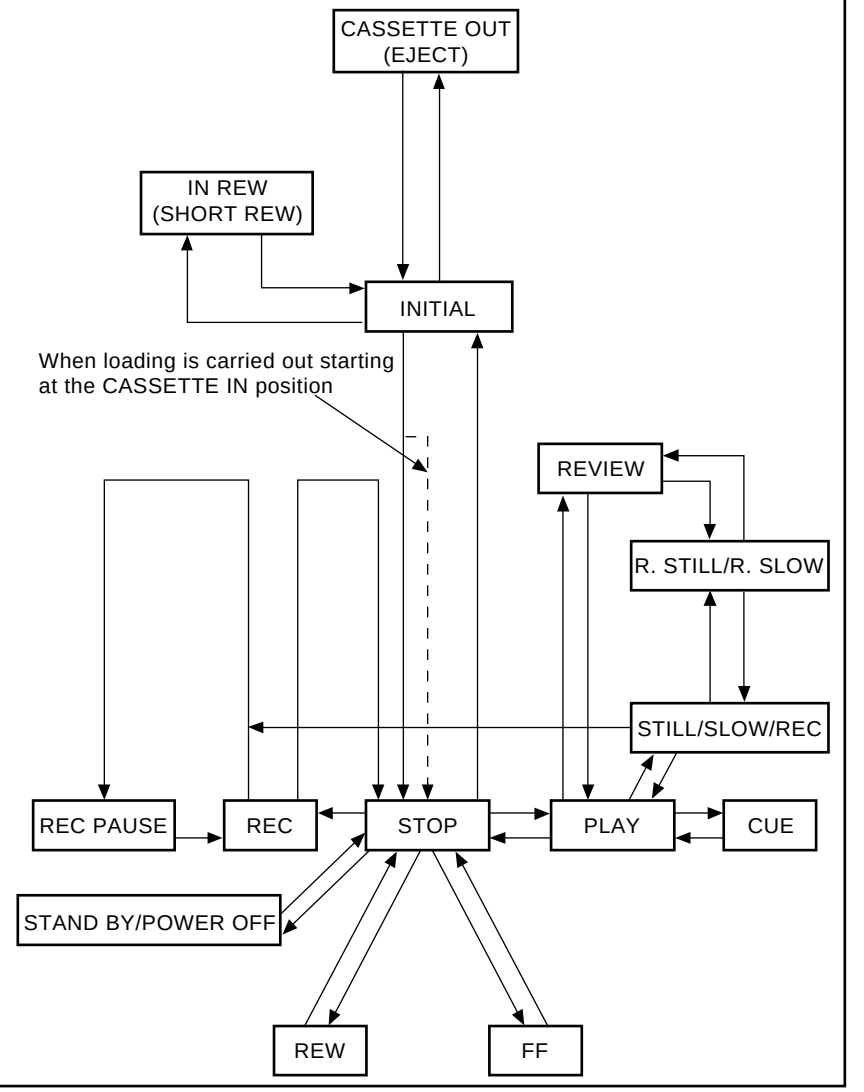
Fig. 2-1-3

2-2. An Overview of the Mechanism Modes

2-2-1. Mechanism Mode Switching Table

Note

The letters and figures enclosed in circles in the mechanism mode column are the codes on the crescent slide.

HEX DATA	Mechanism mode	The principal mode-switching states of the mechanism
6	⇦ EJECT Ⓔ	
4	Distinguished by whether the EP switch is ON or OFF.	
0	Horizontal shift section.	
6	Vertical shift section.	
2	⇦ IN REW Ⓡ	
0		
7	⇦ INITIAL ⑦	
0	Cleaner roller assembly:ON	
1	S/T mounting incline assembly pressure begins.	
0	S/T mounting incline assembly pressure ends.	
1	⇦ REVIEW ①	
0		
2	R.STILL/R.SLOW ②	
0		
2	IDLER POS. ② (Pinch roller OFF)	
0		
3	⇦ STILL/SLOW/REC (INTERVAL) ③	
0		
5	⇦ PLAY/STOP/REC ⑤	
0		
6		
4	BRAKE pos. ④ (POWER OFF / STAND BY)	
0		
6	⇦ FF/REW ⑥	

Mode Switch Output Table

HEX DATA	SW DATA 2	SW DATA 1	SW DATA 0
0	H	H	H
1	H	H	L
2	H	L	H
2	H	L	H
3	H	L	L
4	L	H	H
5	L	H	L
6	L	L	H
7	L	L	L

H: 5
L: 0
Low activ

2-2-2. Movement Check List for the Main Parts of the Mechanism

(S): Strength (W): Weakness

Mechanism mode / Principal parts	EJECT	IN REW	INITIAL	(LOADING)	(UNLOADING)	REV	IDLER	STILL/SLOW	PLAY/STOP	BRAKE (POWER OFF)	FF/REW	R.STILL/ R.SLOW
T brake assembly	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON/OFF	OFF
S brake assembly	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON/OFF	OFF
T soft brake assembly	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON
S soft lever	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
BT lever assembly	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON
BT spring	OFF	OFF	OFF	OFF	OFF	ON(W)	ON(W)	ON(S)	ON(S)	ON(S)	ON(W)	OFF
Pinch roller lever assembly	UP	UP	UP	UP/ DOWN	DOWN/ UP	ON	OFF	ON	ON	OFF	OFF	ON
Clutch mounting assembly	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	PLAY	FF	PLAY
Load lever assembly	UNLO	UNLO	UNLO	LO	LO	LO	LO	LO	LO	LO	LO	LO
Capstan brake assembly	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
S and T incline mounting assembly				LO	UNLO							
Cleaner roller assembly	OFF	OFF	OFF	(ON)	(ON)	OFF	OFF	OFF	OFF	OFF	OFF	OFF

2-2-3. How To Check The Mechanism Mode Position

You can tell which mode the mechanism is currently in by looking at the codes and marking-lines on the crescent slide on the underside of the mechanism chassis. The edge of the crescent mounting is used as the reference line, as shown in Fig. 2-2-2, and the marking-lines and symbols indicating the mechanism modes are displayed on the crescent slide, which slides against the edge of the crescent mounting. The mechanism mode is read off from the marking-line on the slide crescent which is aligned with the reference-line on the crescent mounting.
Example: In Fig. 2-2-2, marking-line 6 is aligned with the reference-line on the crescent mounting, so the mechanism is seen to be in FF/REW mode.

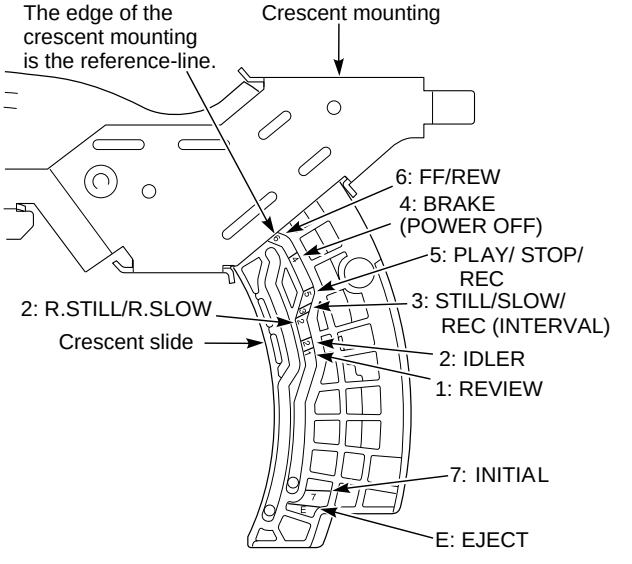


Fig. 2-2-2

2-2-4. Self-diagnosis Display

Some models are equipped with the SELF-DIAGNOSIS DISPLAYS function.
Use it as a means of finding out the symptoms and cause of the error before performing repairs.
For details, refer to the separate service manual for the respective models.

3. Disassembling the Main Parts of the Mechanism

Points to Note

- When fitting the parts of the mechanism, refer to the "Assembly Notes", and proceed in the reverse of dis-assembly order.
- Dis-assembly and assembly should be carried out in EJECT mode unless a movement mode is explicitly specified. EJECT mode is the state in which the cas-sette tape has been ejected.
- Clamps are used to prevent parts coming loose. When removing a clamp, be careful not to force it, as this can result in damage.

3-1. How to Make the Mechanism Move

In order to check a movement such as front loading, fron unloading, tape loading, tape unloading, raising/lower-in and pressing the pinch roller, you will need to operat the loading motor. There are two methods of operatin the loading motor, and these are explained in sections 3 1-1. The above movements can also be performed with-ou operating the loading motor, by following the metho explained in Section 3-1-2.

3-1-1. Operating the Loading Motor by the Manual Method

1. Refer to Section 3-2 and install the mechanism unit.
2. Using your finger, turn the loading motor located at the rear of the mechanism unit. For EJECT, turn the loading motor in the direction of the arrow on the loading motor. For PLAY or FF/REW, turn it in the opposite direction.
   When rotating the loading motor in the EJECT direction with a tape slacken, stop the rotation of the loading motor before beginning front unloading. Rotate the capstan motor with your hand, wind the slacked part of the tape, and rotate the loading motor in the EJECT direction again.
   When carrying out front loading, release the lock by pressing down the tray lock lever ⑧ and the lid opener lever ⑨ of the cassette mechanism assembly (shown in Fig. 3-2-2).

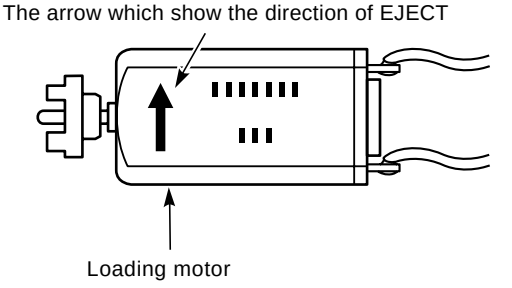


Fig. 3-1-1

3-1-2. Making the Mechanism Move Using the Manual Method

1. Refer to Section 3-2 and remove the mechanism unit.
2. Refer to Section 3-15 and remove the wheel gear 2.
3. If you turn the main cam counterclockwise, the mechanism will switch to a mode such as PLAY or FF/REW. To switch from FF/REW mode to EJECT mode, turn the main cam clockwise.

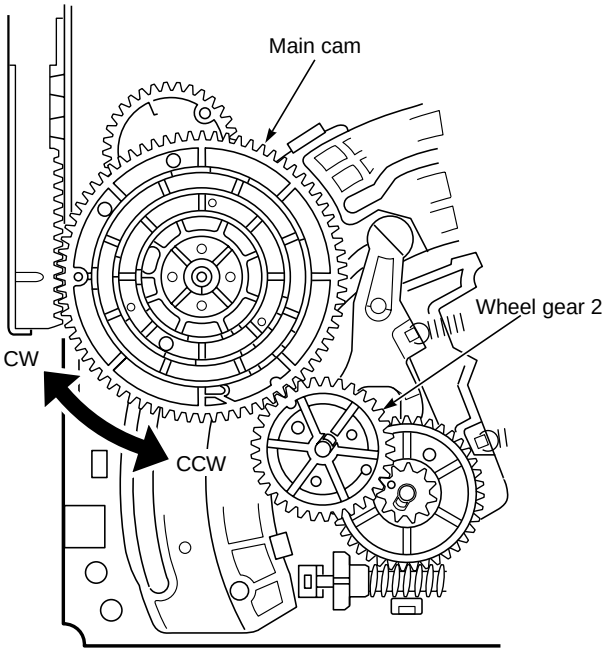


Fig. 3-1-2

3-2. Mechanism Unit

1. Remove the top cover, bottom cover and front cabinet assembly.
2. Unplug the flat cable ① from the CP-1 PWB assembly on the cylinder (drum), and unplug the ACE/FE head connectors ②.
3. Unplug the flat cable from the stator.
4. Unplug the dew sensor connector ④.
5. Remove the four screws ⑤, then lift up the mechanism unit. The tray ⑥ will stop you removing the two screws ⑤ on the front, so release the lock by pressing down the tray lock lever ⑦ and the lid opener lever ⑧ shown in Fig. 3-2-2, then slide off the tray ⑥. Move the tray by referring to Section 3-1 and turn the loading motor in the PLAY direction.

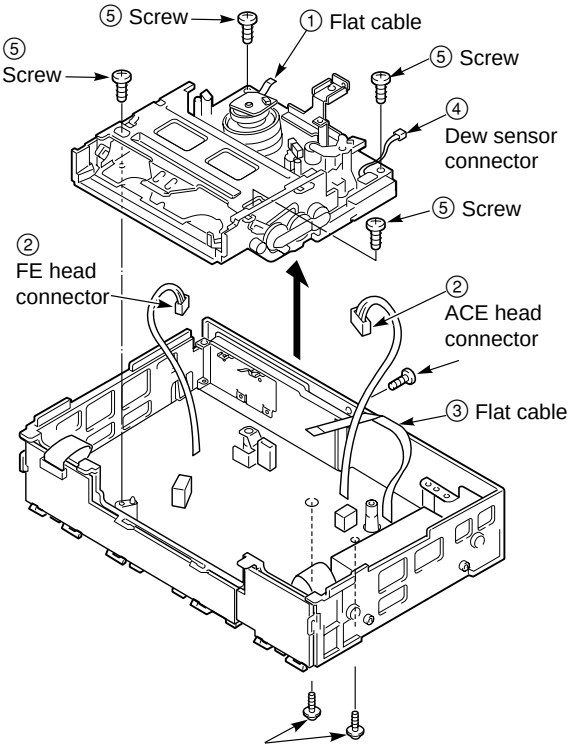


Fig. 3-2-1

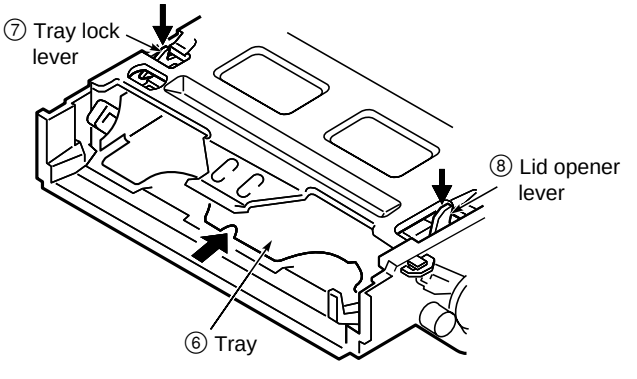


Fig. 3-2-2

3-3. Cassette Drive Mechanism

3-3-1. Cassette Mechanism Assembly

1. Put the VCR into EJECT mode.
2. Remove the two screws ①.
3. Lift up the back of the cassette mechanism assembly ② slightly, and remove the two hooks ③ on the front.

Assembly Notes:

1. The cassette mechanism assembly and the mecha-nism chassis should both be fitted in EJECT mode.
2. Check that the two hooks ③ have snapped into the mechanism chassis, and make sure that the two holes ④ in the cassette mechanism assembly are aligned with the two dowels ⑤ on the mechanism chassis.
3. Make sure that the big tooth on the pinion gear of the cassette mechanism assembly slots properly into the deepest gap in the start rack gear, as shown in Fig. 3-3-2.
4. When fitting the two screws ①, use the torque gauge screwdriver (VHJ-0014). Give the screws a tightening torque of 5 kg•cm.

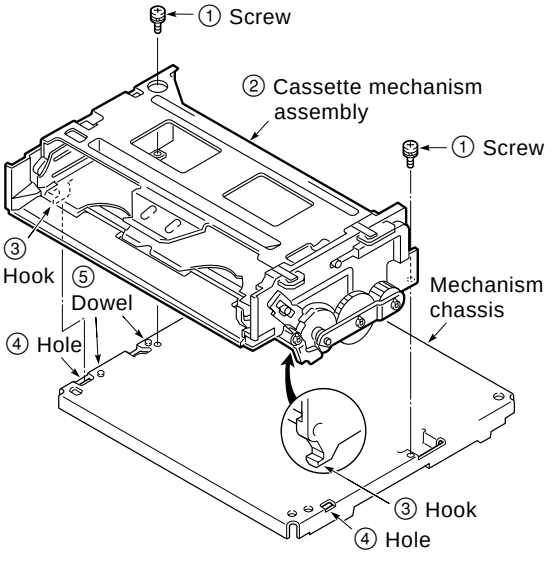


Fig. 3-3-1

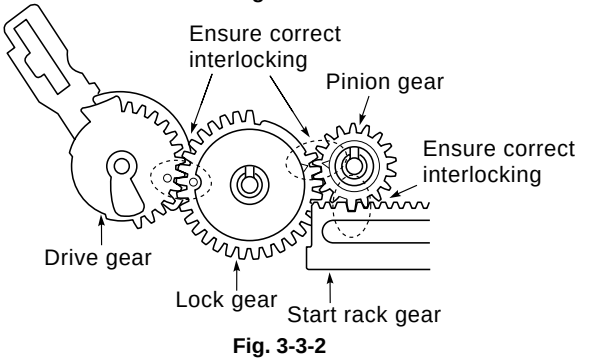


Fig. 3-3-2

3-3-2. Cassette Drive Gear

1. Refer to Section 3-3-1 and remove the cassette mecha-nism assembly.
2. Remove clamps ① and ②, then remove the gear holder ③.
3. Remove the clamp ①, then remove the pinion gear ④.
4. Remove the clamp ②, then remove the lock gear ⑤.

Assembly Notes:

1. Put the tray in the EJECT mode position before fitting any parts.
2. Apply grease (VHJ-0100) to the gear mounting shafts, all the gear teeth, and the cam part of the drive gear ⑥.
3. Ensure that the drive gear, the lock gear and the pinion gear interlock correctly, as shown in Fig. 3-3-2.
4. Make sure the clamps ① and ② snap in to the gear holder ③.

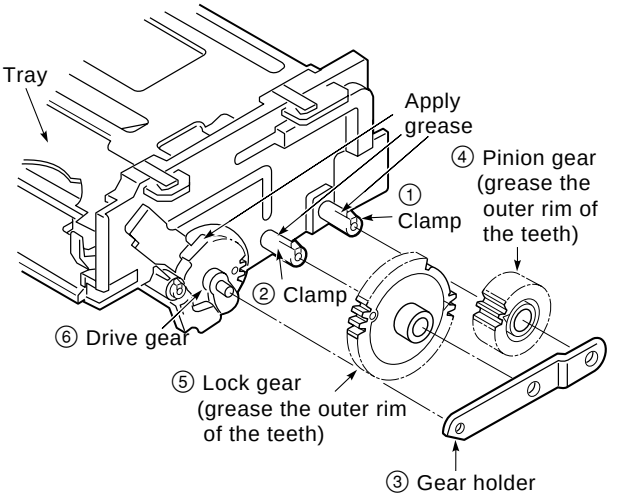

Tray
Apply grease
④ Pinion gear (grease the outer rim of the teeth)
① Clamp
② Clamp
⑥ Drive gear
⑤ Lock gear (grease the outer rim of the teeth)
③ Gear holder

Fig. 3-3-3

3-3-3. Door Opener, Under Frame and Stand L

1. Remove the cassette mechanism assembly, referring to Section 3-1.
2. Remove the two clamps ① and take out the under frame ②, pulling it towards you.
3. Press down the tray lock lever ③ and the lid opener lever ④, and loosen the tray ⑤, lifting it away from you. In this state, press the clamp ⑥ and remove the door opener lever ⑦.
4. Remove the special washer ⑭, then remove the washer ⑮.
5. Remove the two clamps ⑧ and take out the stand L ⑨.
   Be careful not to exert too much force on the clamps ⑧, as this could cause damage.

Assembly Notes:

1. Apply grease (VHJ-0100) to the grooves ⑪ on the stand L, the inside of the hole ⑬ in the drive shaft ⑫, and the mounting hole ⑯ in the door opener lever of the stand R.
2. Before fitting the stand L ⑨, be sure to move the tray ⑤ back as far as the EJECT mode position. Put the two pins ⑩ on the tray ⑤ into the grooves ⑪ on the stand L. Put the drive shaft ⑫ into the hole ⑬.
3. Be sure to fasten the two clamps ① and the clamp ⑥ on the stand R, and to fasten the two clamps ⑧ on the stand L.

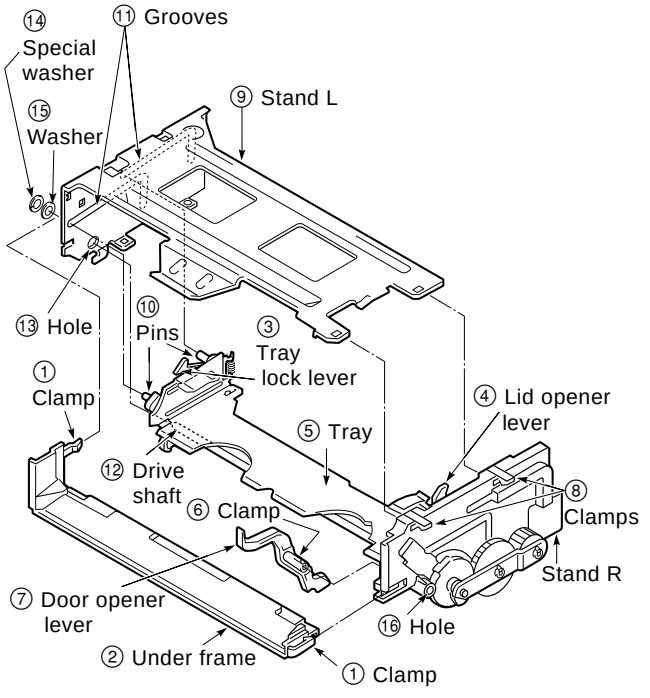


Fig. 3-3-4

3-3-4. Start Rack Gear and Front Rack Gear

1. Remove the mechanism unit, referring to Section 3-2.
2. Remove the cassette mechanism assembly, referring to Section 3-3-1.
3. Remove the special screw ①. When you do this, slide the front rack gear assembly ② towards the front until it stops, then take it off the shaft ③. Take care not to damage the shaft ③.
4. Remove the spring ④.
5. Remove the clamp ⑥ on the front rack gear ⑤, then remove the start rack gear ⑦.

Assembly Notes:

1. Apply grease (VHJ-0100) to the front rack gear ⑤ and all over the inside of the groove on the start rack gear ⑦.
2. Align the positioning mark ⑧ on the front rack gear ⑤ with the mark ⑩ on the main cam ⑨.
3. When installing the cassette mechanism assembly, refer to Section 3-3-1 and align the start rack gear with the pinion gear.

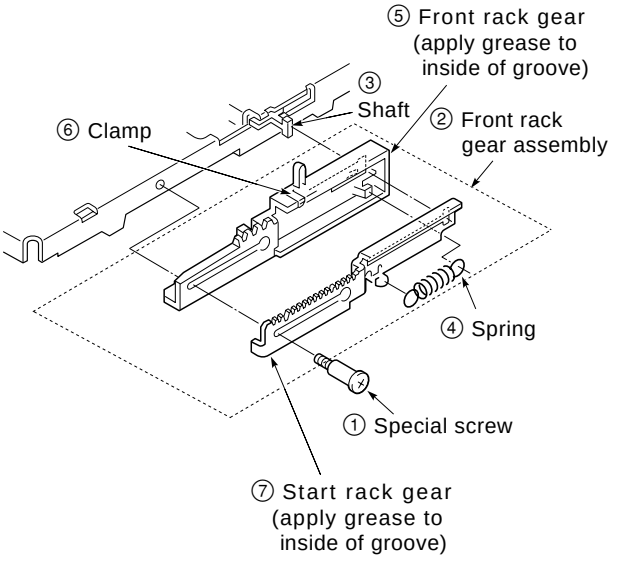

⑤ Front rack gear (apply grease to inside of groove)
③ Shaft
⑥ Clamp
② Front rack gear assembly
④ Spring
① Special screw
⑦ Start rack gear (apply grease to inside of groove)

Fig. 3-3-5

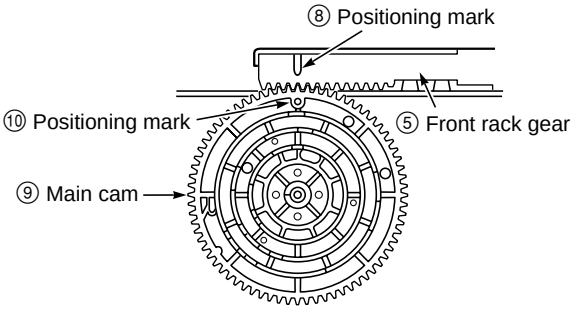


Fig. 3-3-6

3-4. Cleaner Roller Assembly

1. Remove the clamp ① and take out the cleaner lever ②. When you do this, be careful not to bend the plastic springs Ⓐ and Ⓑ on the cleaner lever ②.
2. Remove the clamp ③, and take out the cleaner roller assembly ④. Be careful not to touch the sponge on the cleaner roller assembly ④.

Assembly Notes:

1. When mounting the cleaner lever ② on the shaft ⑤, press the clamp ① in the direction shown by the arrow, and snap it into the mounting ⑥ on the audio R/P head assembly.

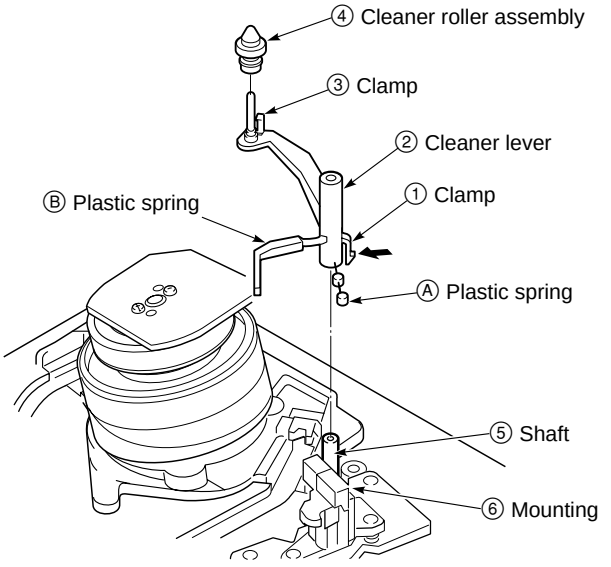


Fig. 3-4-1

3-5. Cylinder (Drum)

3-5-1. Cylinder (Drum) Motor, Upper Cylinder Assembly

1. Disconnect the flexible cable ② connected to the stator ①.
2. Remove the two screws ③, and remove the stator ①, and spring ④.
   In this state, the cylinder earth chip ⑤ will fall off if the top and bottom of the mechanism unit are reversed.
   Note
   Cylinder earth chip ⑤ can be removed by removing the cylinder motor mounting ⑨ in step 4).
3. Remove the two screws ⑥ and remove the rotor ⑦.
4. Loosen the screw ⑧ with the hexagonal wrench, and remove the cylinder motor mounting ⑨.
   Note
   The hexagonal wrench (VHJ-0113) is 2mm diagonally. It is provided with the servicing tool upper drum fitting tool kit (VHJ-0112).
5. Remove the upper cylinder assembly ⑩ and the spacer ⑪.
   The spacer ⑪ may come off attached to the upper cylinder assembly ⑩.

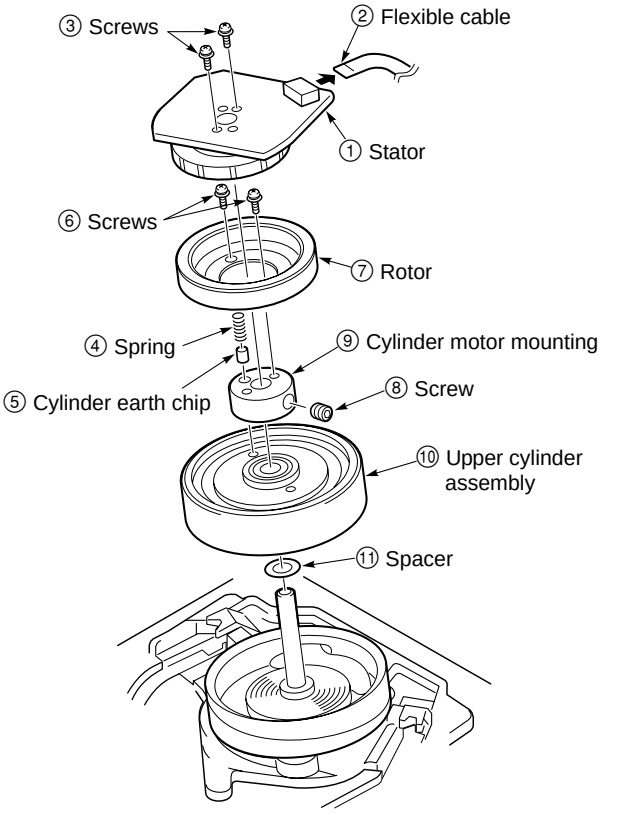


Fig. 3-5-1

Assembly Notes:

1. Adjustments are required when attaching the cylinder motor mounting ⑨. As shown in Fig. 3-5-2, face the protruded side of the cylinder motor mounting ⑨ downwards, and with the hexagonal wrench pressed to screw ⑧, adjust the position of the cylinder motor mounting ⑨ in the direction of the screw ⑫. In this state, hold the cylinder motor mounting ⑨ with the upper drum fitting tool (VHJ-0112) and tighten the screw ⑧ with the hexagonal wrench.
2. When attaching the rotor ⑦, the phase must be adjusted to that of the upper cylinder assembly ⑩. As shown in Fig. 3-5-3, attach so that the hole ⓐ of the upper cylinder assembly ⑩ and hole ⓑ of the rotor ⑦ are on the same side.
3. Tighten the two screws ⑥ for attaching the rotor ⑦ and the two screws ③ for attaching the stator ① using a torque of 2.5 to 3.5 kg•cm.
4. Be careful that the tape path surface of the cylinder (drum) does not scratch or become dirty.
   If it becomes dirt, clean.
5. After attaching, refer to "4-3. Tape path adjustment" and the section on electrical adjustments in the service manuals for the respective models, and adjust the switching position of the servo circuit.

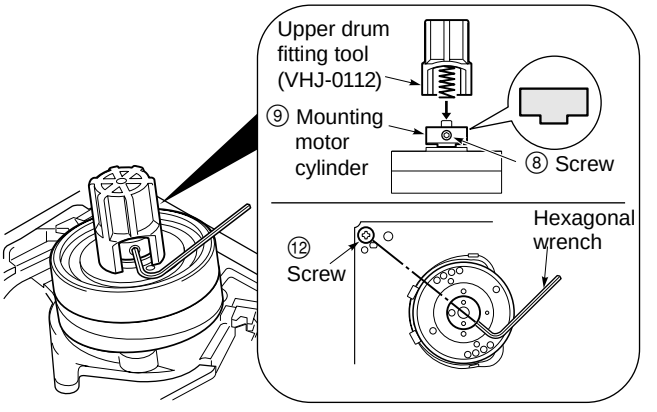


Fig. 3-5-2

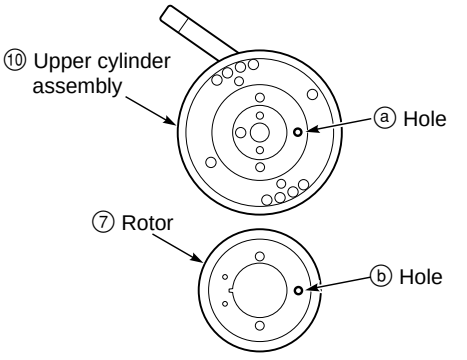


Fig. 3-5-3

3-5-2. Cylinder Mounting

1. Put the mechanism into EJECT mode.
2. Refer to Section 3-4 and remove the cleaner lever.
3. Disconnect the flexible cable connected to the stator ①.
4. Disconnect the flexible cable connected to the connector ②.
5. Remove the three screws ③. Taking care not to scratch or soil the tape path surface of the cylinder (drum), lift the cylinder mounting ④ slightly, and keeping it raised. (See Fig. 3-5-4)

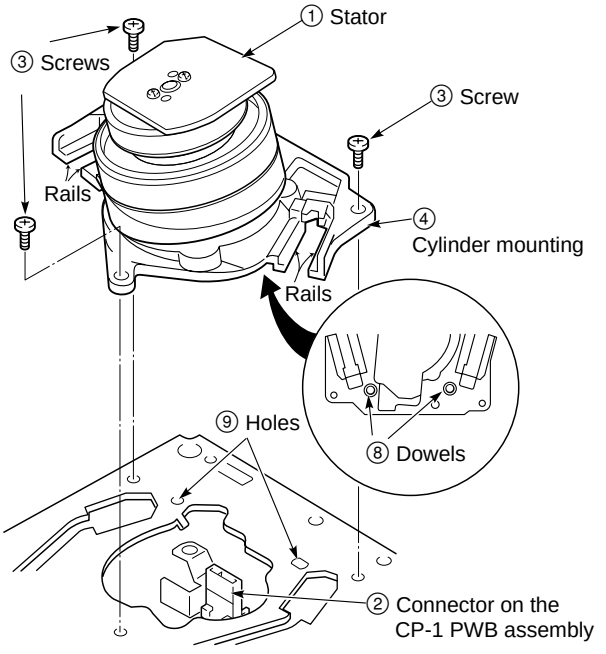


Fig. 3-5-4

6. Remove the three screws ⑤ at the bottom of the cylinder mounting ④. (See Fig. 3-5-5)

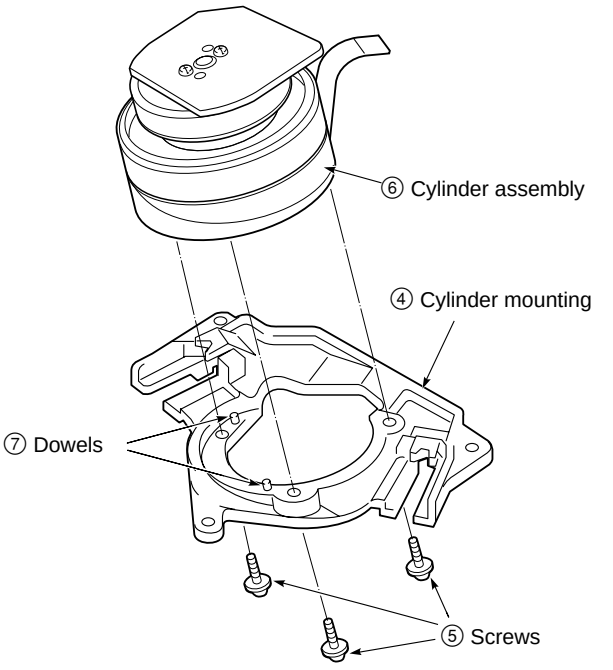


Fig. 3-5-5

Assembly Notes:

1. Align the cylinder assembly ⑥ with the two dowels ⑦ on the cylinder mounting ④. (See Fig. 3-5-5)
2. Apply grease (VHJ-0100) to the rails of the cylinder mounting ④ (grease the parts which come in contact with the S and T incline mounting assembly). (See Fig. 3-5-5)
3. Align the two dowels ⑧ on the cylinder mounting ④ with the two holes ⑨ on the mechanism chassis. (See Fig. 3-5-4)
4. After assembly, clean the tape path surface of the cylinder (drum).
5. After replacing the cylinder mounting or the cylinder assembly, do the tape path adjustment as instructed in Section 4-3, and do the switching position adjustment of the servo circuit.

3-6. FE Head and ACE Head

3-6-1. Audio R/P Head Assembly (ACE Head)

1. Unplug the connector from the audio R/P head assembly (ACE head).
2. Remove the two screws ①, then remove the audio R/P head assembly (ACE head) ② and the washer ③.

Assembly Notes:

1. Align the hole ④ on the audio R/P head assembly (ACE head) with the pin ⑤ on the chassis unit.
2. After assembly, check that the clamp ⑥ on the cleaner roller assembly has snapped into the mounting of the audio R/P head assembly (ACE head) ②.
3. After assembly, clean the surface of the head with a soft cloth or chamois.
4. After assembly, refer to Section 4-3, and adjust the head height, the azimuth and the tracking (X) position.

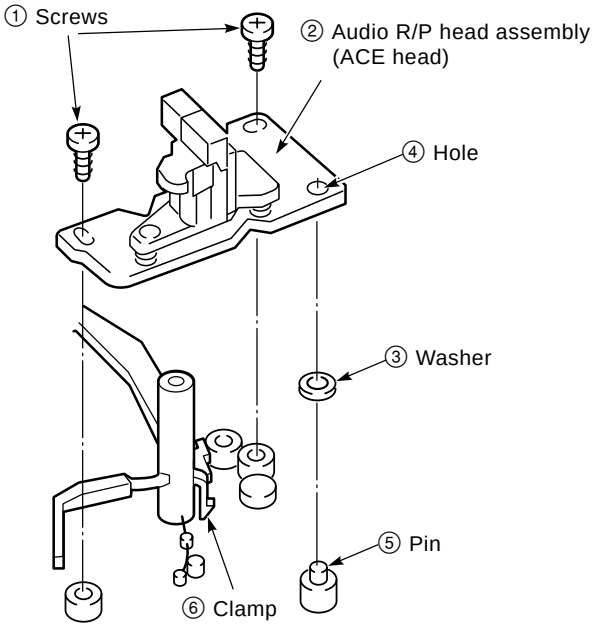


Fig. 3-6-1

3-6-2. Full Erase Head

1. Unplug the connector from the full erase head ①.
2. Remove the screw ② and the full erase head ①.

Assembly Note:

1. After assembly, clean the full erase head ①.

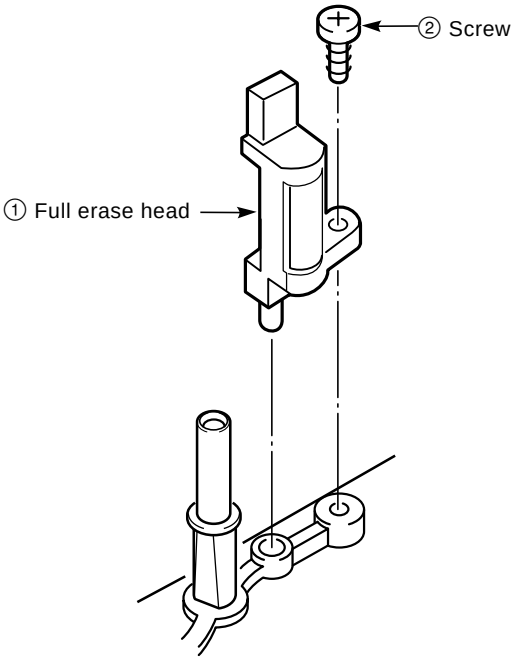


Fig. 3-6-2

3-7. Capstan Motor

3-7-1. Capstan Motor

[Case 1. High speed FF/REW model]

1. Refer to Section 3-2, then remove the mechanism unit.
2. Remove the reel belt ①.
3. Remove the three screws ② and the capstan motor ③.
4. Remove the heat transfer spacer ④ from the capstan motor ③ or mechanism chassis.

Assembly Notes:

1. Check that connector ⑤ is inserted in the CP-1 PWB assembly.
2. When fitting the three screws ②, use the torque gauge screwdriver (VHJ-0014). Give the screws a tightening torque of 3.5 kg•cm.
3. After assembly, clean the capstan shaft with a soft cloth or chamois.

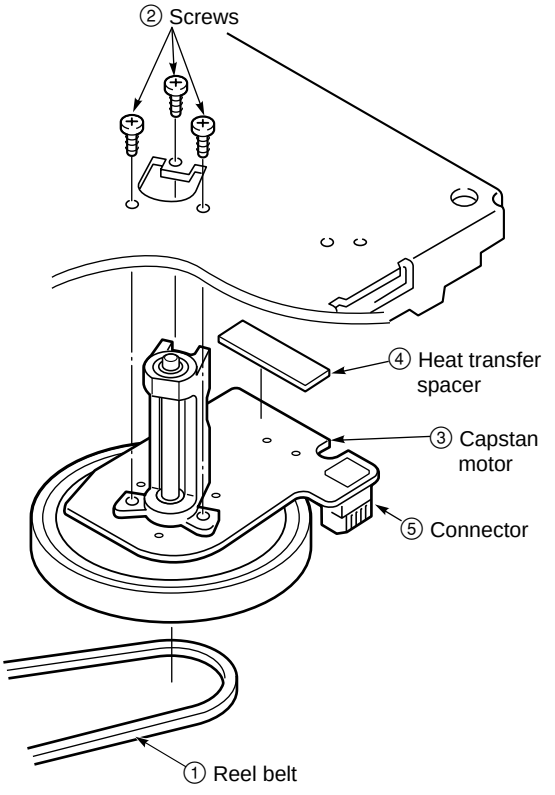


Fig. 3-7-1

[Case 2. Normal FF/REW model]

1. Refer to Section 3-2, then remove the mechanism unit.
2. Remove the screw ①, then remove the capstan mounting ②.
3. Remove the reel belt ③.
4. Remove the three screws ④ and the capstan motor ⑤.

Assembly Notes:

1. Check that connector ⑥ is inserted in the CP-1 PWB assembly.
2. When fitting the three screws ④, use the torque gauge screwdriver (VHJ-0014). Give the screws a tightening torque of 3.5 kg•cm.
3. After assembly, clean the capstan shaft with a soft cloth or chamois.

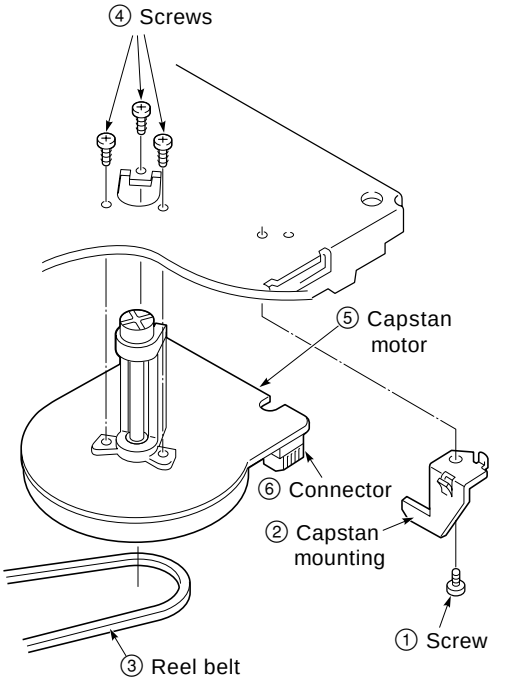


Fig. 3-7-2

3-7-2. Capstan Brake Assembly

1. Remove the spring ①.
2. Remove the clamp ②, then remove the capstan brake assembly ③.

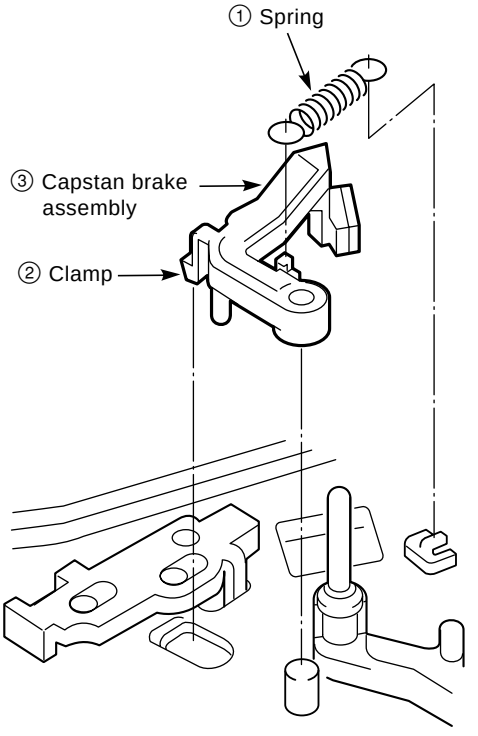


Fig. 3-7-3

3-8. Loading Motor Assembly and Worm Gear Assembly

1. Refer to Section 3-2 and remove the mechanism unit.
2. Remove the soldering on the lead wires ② of the loading motor assembly ① from the MC-1 PWB assembly. When you do this, be careful not to let the soldering iron touch any other parts.
3. Press the clamp ③, and remove the loading motor assembly ① and the damper ④. Be careful not to exert too much force on the clamp ③.
4. Remove the worm gear assembly ⑤. To maintain performance, do not dis-assemble the worm gear assembly ⑤.

Assembly Notes:

1. Apply grease (VHJ-0010) to the teeth of the worm gear assembly ⑤. Then apply grease (VHJ-0114) to in the hole of the worm gear assembly ⑤.
2. Check that the clamps ③ and ⑥ are securing the loading motor assembly.
3. Check the polarity of the lead wires ② (the orange wire is the positive terminal, and the gray wire is the negative terminal). After soldering the lead wires ②, adjust them so that they do not touch the friction gear assembly.

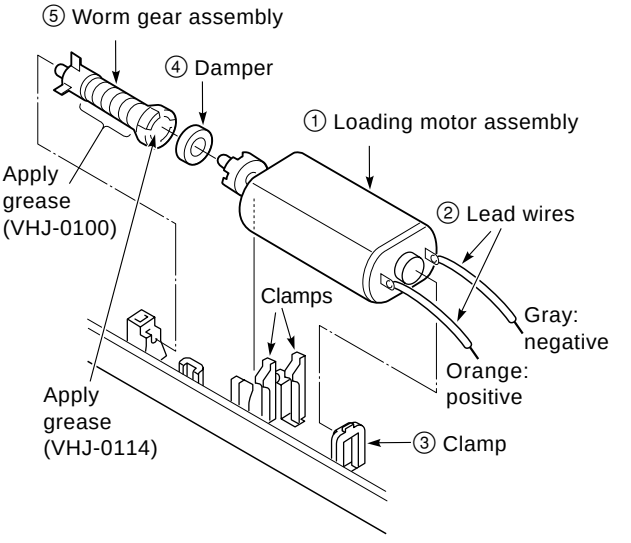


Fig. 3-8-1

3-9. Pinch Roller Pressur Mechanism

3-9-1. Pinch Roller Lever Assembly

1. Remove the clamp ①, then remove the pinch lift mounting ②.
2. Remove the spring ③, then remove the pinch roller lever assembly ④ off the pinch lift mounting ②. Before you do this, align the Indentation ⑤ on the pinch roller lever assembly ④ with the clamp ⑥ on the pinch lift mounting ②.

Assembly Note:

1. Be careful to keep the surface of the pinch roller free of dust and dirt.

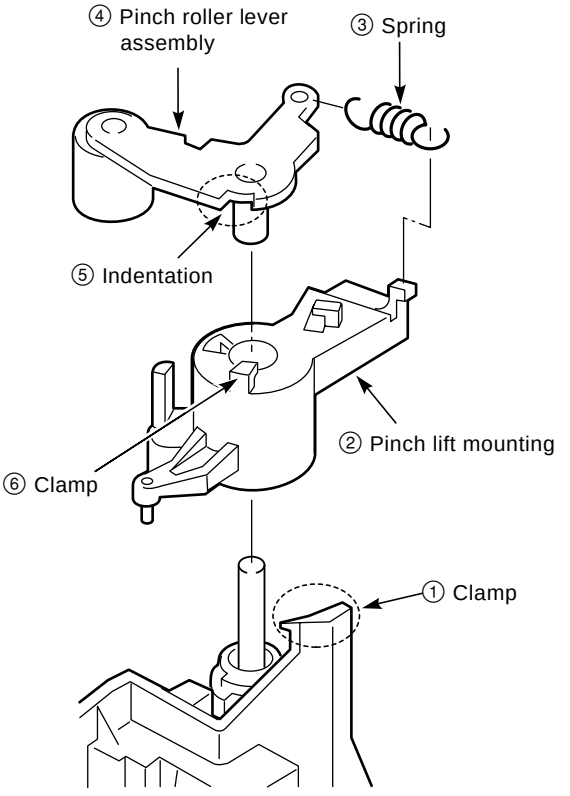


Fig. 3-9-1

3-9-2. Pinch Lift Cam and Pinch Cam Gear

1. Refer to Section 3-2 and remove the mechanism unit. When you do this, make sure the mechanism is in EJECT mode.
2. Refer to Section 3-9-1 and remove the pinch roller lever assembly.
3. After removing the screw ①, undo the three clamps ②, then remove the opener mounting ③.
4. Remove the clamp ④ and the pinch lift cam ⑤.
5. Remove the pinch cam gear ⑥.

Assembly Notes:

1. Apply grease (VHJ-0100) around the shaft ⑦, all over the teeth Ⓑ of the pinch cam gear ⑥, all over the teeth of the pinch lift cam ⑤, all over the cam grooves Ⓐ, and all over the "V Part Ⓒ" of the opener mounting ③. Apply grease (VHJ-0101) to the outside of the shaft ⑧ and all over the top cam Ⓓ of the pinch cam gear ⑥.
2. Check that the positioning mark ⑩ on the OPT pinch relay gear ⑨ is aligned with the arrow ⑪ on the MC-1 PWB assembly, as shown in Fig. 3-9-3. Then align the square mark ⑫ on the pinch cam gear ⑥ with the arrow ⑪ on the MC-1 PWB assembly.
   After that, align the round hole ⑬ on the pinch lift cam ⑤ with the indentation ⑭ on the pinch cam gear ⑥.
   If you have carried out the above alignments and the pinch roller will still not move up and down or perform the pressing movement correctly, refer to Section 3-15 and check the alignment of the gear wheels 1 and 2, the main cam, and the OPT pinch relay gear.

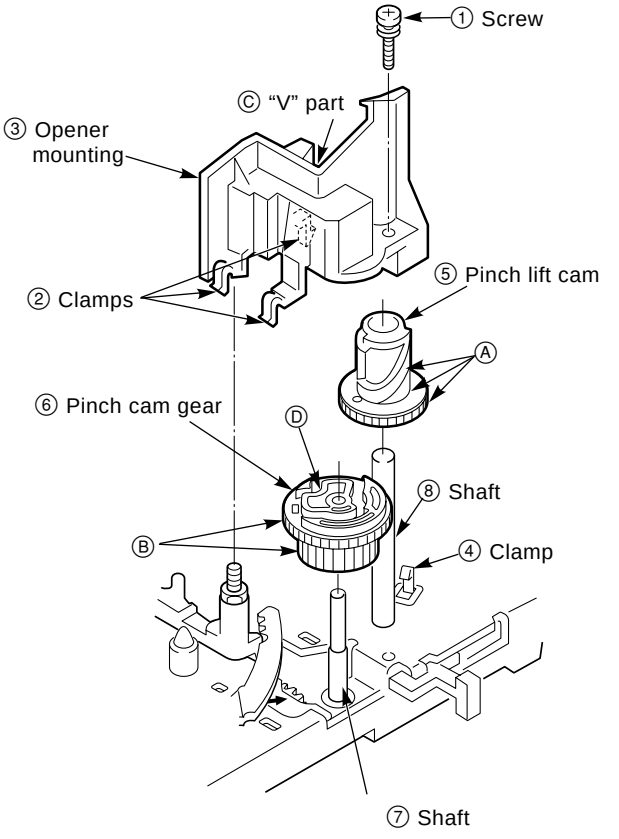


Fig. 3-9-2

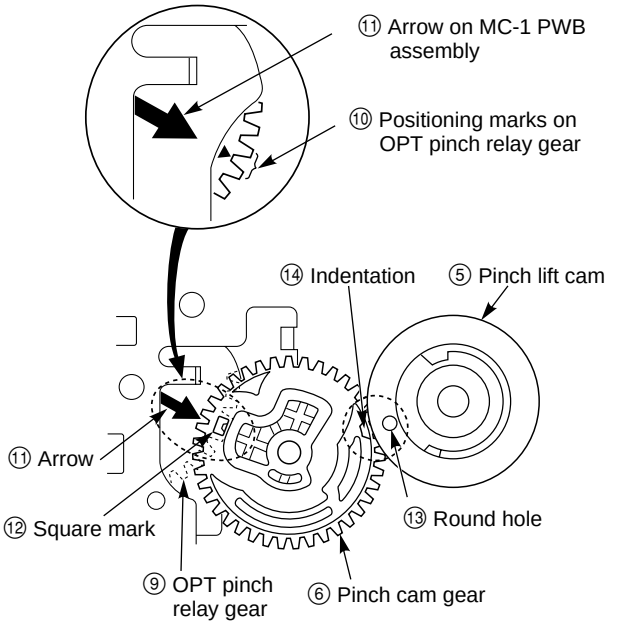

⑪ Arrow on MC-1 PWB assembly
⑩ Positioning marks on OPT pinch relay gear
⑭ Indentation
⑤ Pinch lift cam
⑪ Arrow
⑫ Square mark
⑬ Round hole
⑨ OPT pinch relay gear
⑥ Pinch cam gear

Fig. 3-9-3

3-10. L Guide Act Lever Assembly, Load Lever Assembly and Stopper Lever Assembly

1. Refer to Section 3-3 and remove the cassette mechanism assembly.
2. Refer to Sections 3-9-1 and 3-9-2 , then remove the pinch roller lever assembly and the opener mounting.
3. Remove the stopper spring ①.
4. After removing the washer ②, remove the L guide act spring ③ and the L guide act lever assembly ④.
5. Remove the special nut ⑤, then remove the load lever assembly ⑥ and the L guide lever spring ⑦.
6. Remove the stopper lever assembly ⑧.

Assembly Notes:

1. Apply grease (VHJ-0100) to the toothed area Ⓐ of the L guide act lever assembly ④ and around the shafts ⑨ and ⑩.
2. Refer to Section 4-3 and adjust the height of the load lever assembly.
3. Hook the L guide lever spring ⑦ into the stopper ⑪ and the load lever assembly ⑥ shown in Fig. A.
4. Put the pin ⑫ of the L guide act lever assembly into the cam groove ⑬ of the crescent slide.

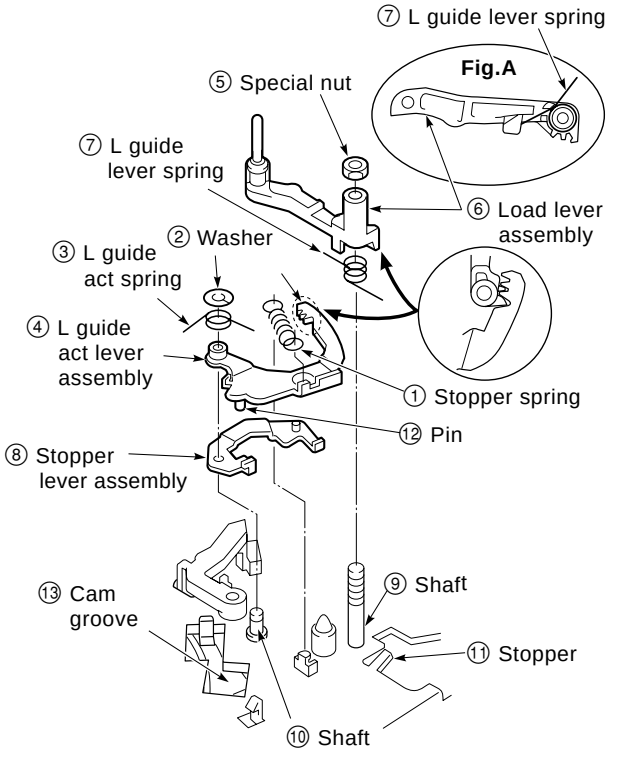


Fig. 3-10-1

3-11. BT Lever Assembly

1. Refer to Section 3-2 and remove the mechanism unit.
2. Refer to Section 3-3-1 and remove the cassette mechanism assembly.
3. Remove the BT spring ①, and remove the sub BT spring ② on the underside of mechanism chassis.
4. Remove the clamp ③ on the underside of the mechanism chassis, then remove the BT lever assembly ④.
5. Remove the clamp ⑤ on the band brake assembly ⑥. Then, as shown in Fig. A, align the other end of the band brake assembly with the protruding parts of the BT lever assembly ④ before removing it.

Assembly Notes:

1. When fitting the BT lever assembly ④, be careful not to bend the stopper ⑦ or the S incline mounting assembly ⑧ out of shape by knocking it against them.
2. Hook the long hook of the BT spring ① into the BT lever assembly ④, as shown in Fig. B.
3. After assembly, make sure that the mountings on both ends of the band brake assembly ⑥ are positioned as shown in Fig. C.
4. After assembly, refer to Section 4-2-1, and make the appropriate adjustment.

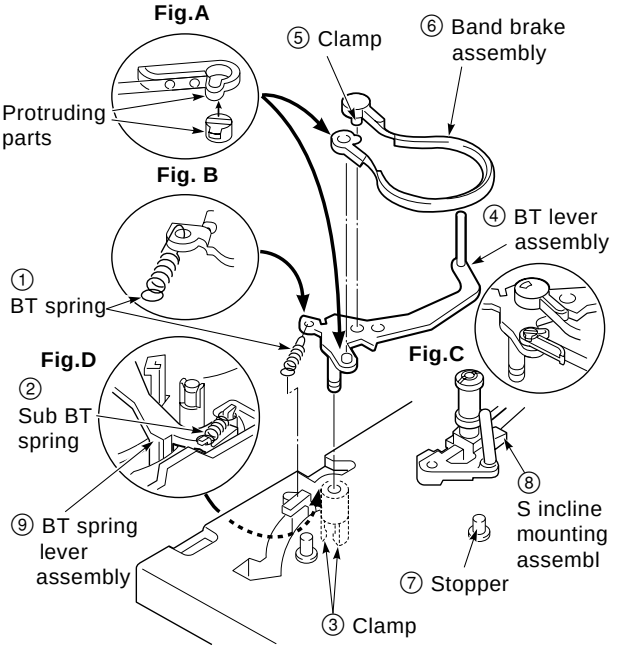


Fig. 3-11-1

3-12. Reel Drive Mechanism

3-12-1. Reel Belt, Reel Pulley, Friction Gear Assembly and Clutch Change Lever

1. Refer to Section 3-2 and remove the mechanism unit.
2. Remove the reel belt ① from the reel pulley ②.
3. Take off the washer ③ and remove the reel pulley ②.
4. Take off the washer ④ and remove the friction gear assembly ⑤.
5. Remove the clutch change spring ⑥.
6. Remove the clamp ⑦ gripping the top of the mechanism chassis, then remove the clutch change lever ⑧.

Assembly Notes:

1. After cleaning the shafts ⑨ and ⑩, apply a drop of oil (VHJ-0099) to each.
2. Be careful not to get any grease on the reel belt ①.

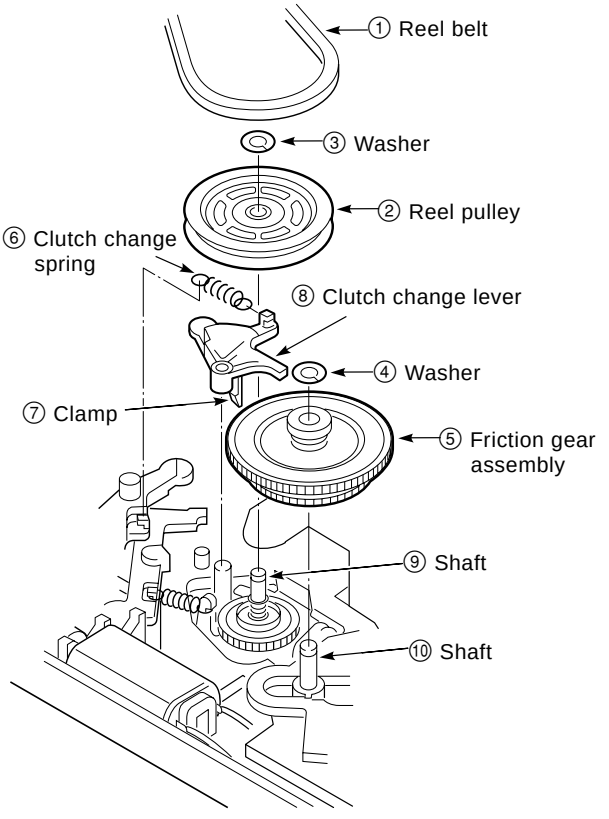


Fig. 3-12-1

3-12-2. Clutch Mounting Assembly

1. Refer to Section 3-3-1 and remove the cassette mechanism assembly.
2. Refer to Section 3-12-1 and remove the reel pulley.
3. Remove the two screws ①, then remove the clutch mounting assembly ②.

Assembly Notes:

1. Align the two holes ③ with the shafts ④ and ⑤. Be careful not to press part A of the clutch mounting assembly ② against the band brake assembly.
2. After assembly, make sure that the clamp on the clutch change lever has snapped into the chassis.

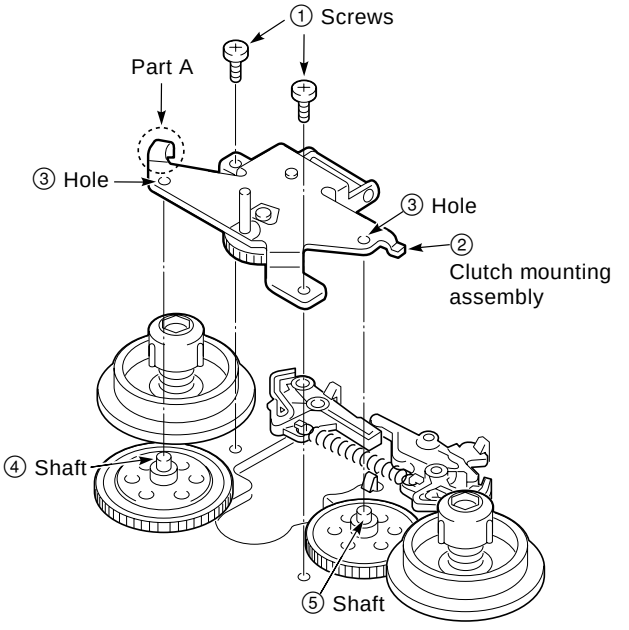


Fig. 3-12-2

3-12-3. S Soft Lever, Supply Reel Assembly and S Reel Gear

1. Remove the S soft spring ①.
2. Remove the clamp ②, then remove the S soft lever ③.
3. Refer to Section 3-12-2 and remove the clutch mounting assembly.
4. Refer to Section 3-11 and remove the band brake assembly, then remove the supply reel assembly ④, washer ⑤ and the S reel gear ⑥.

Assembly Notes:

1. After cleaning the shafts ⑦ and ⑧, apply a drop of oil (VHJ-0099) to each.
2. After assembly, clean the side of the supply reel assembly ④.

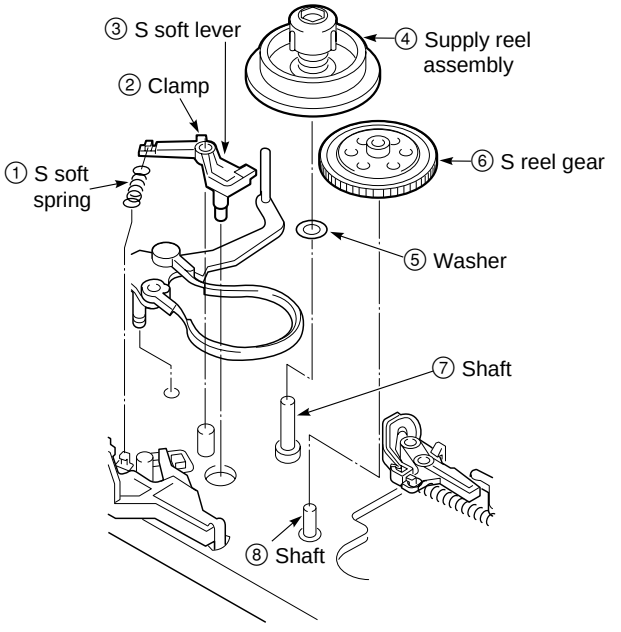


Fig. 3-12-3

3-12-4. T Soft Brake Assembly, Take Up Reel Assembly, T Reel Gear

1. Remove the T soft spring ①.
2. Remove the clamp ②, then remove the T soft brake assembly ③.
3. Refer to Section 3-12-2 and remove the clutch mounting assembly.
4. Pressing the T brake assembly ④ in the direction of the arrow, remove the take up reel assembly ⑤, washer ⑥ and the T reel gear ⑦.

Assembly Note:

1. After cleaning the shafts ⑧ and ⑨, apply a drop of oil (VHJ-0099) to each.

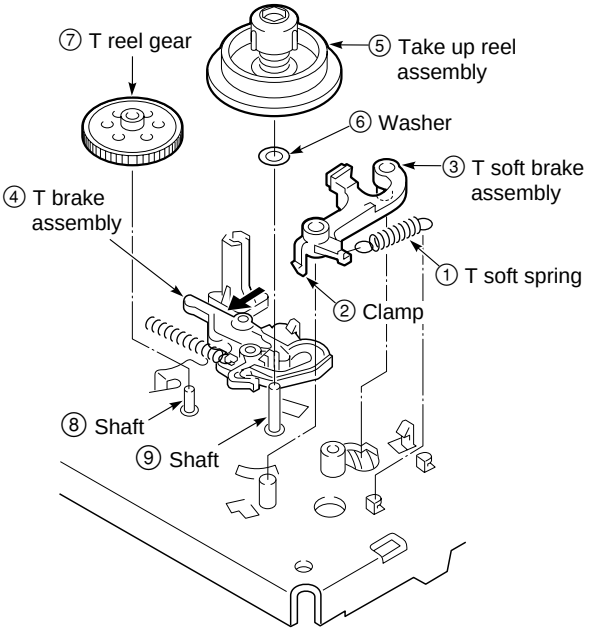


Fig. 3-12-4

3-13. Brakes

3-13-1. S Brake Assembly, T Brake Assembly, T Brake Act Slide

1. Refer to Section 3-3-1 and remove the cassette mechanism assembly.
2. Remove the two clamps ①, then remove the T brake act slide ②.

   Note

   You can remove the S brake assembly ⑦ and the T brake assembly ⑤ without removing the T brake act slide ②.
3. Remove the brake spring ③.
4. Remove the two clamps ④ simultaneously, then remove the T brake assembly ⑤.
5. Remove the clamp ⑥, then remove the S brake assembly ⑦.

Assembly Notes:

1. Apply grease (VHJ-0100) to the shafts ⑧ and ⑨.
2. When fitting the T brake act slide ②, align the mark ⑩ with the shaft ⑪.

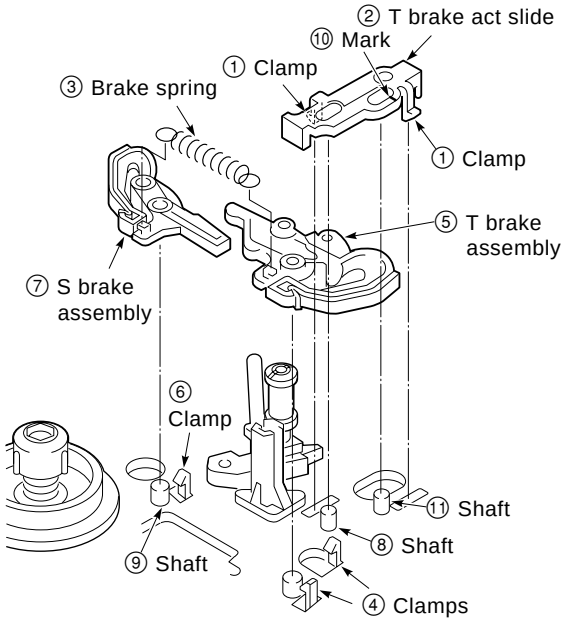


Fig. 3-13-1

3-13-2. Brake Control Lever and Brake Act Lever Assembly

1. Refer to Section 3-2 and remove the mechanism unit.
2. Refer to Section 3-15 and remove the wheel gear 2.
3. Refer to Sections 3-12-1, then remove the reel belt and the reel pulley.
4. Remove the clamp ①, then remove the wheel gear 1 ②.
5. Remove the clutch change spring ③.
6. Remove the clamps ④ and ⑤, then remove the brake control lever ⑥. Remove the clamp ④ on the topside of the mechanism chassis.
7. Remove the brake return spring ⑦.
8. Refer to Section 3-8 and remove the worm gear assembly.
9. Remove the clamp ⑧ and clamp ⑤, then remove the brake act lever assembly ⑨. To maintain the performance of the brake act lever assembly ⑨, do not disassemble it.

Assembly Notes:

1. Apply grease (VHJ-0100) to the shafts ⑩ and ⑪, to the teeth of the wheel gear 1 ②, and to the pin ⑫ of the brake control lever ⑥.
2. Put the pin ⑫ of the brake control lever ⑥ into the cam groove ⑬ of the crescent slide.
3. Before fitting the wheel gear 1 ②, align the hole ⑭ with the hole ⑮ on the mechanism chassis.
4. Refer to Section 3-15 and align the wheel gear 2.

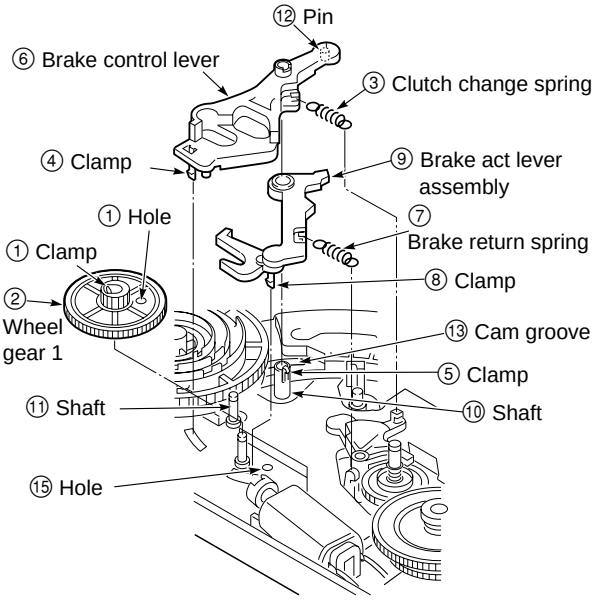


Fig. 3-13-2

3-13-3. S Brake Act Slide and BT Spring Lever Assembly

1. Refer to Section 3-16 and remove the crescent slide.
2. Refer to Section 3-12-1 and remove the friction gear assembly.
3. Slide the S brake act slide ① in the direction of the arrow Ⓐ, then remove it.
4. Refer to Section 3-11 and remove the BT spring.
5. Remove the sub BT spring ②.
6. Press the BT spring lever assembly ③ until it touches the pin ④, then remove it.

Assembly Notes:

1. Apply grease (VHJ-0100) to the shaft ⑤ shown in Fig. 3-13-3, and to the BT spring lever assembly ③ and the S brake act slide ① shown in Fig. 3-13-4.
2. After mounting the BT spring lever assembly ③ on the Shaft ⑤, hook the BT spring onto the clamp ⑥ and press it until it touches the pin ⑦.
3. Make sure that the clamps ⑧, ⑨ and ⑩ have snapped into the S brake act slide ①. Align the arrow ⑪ on the S brake act slide ① with the arrow ⑫ on the mechanism chassis.

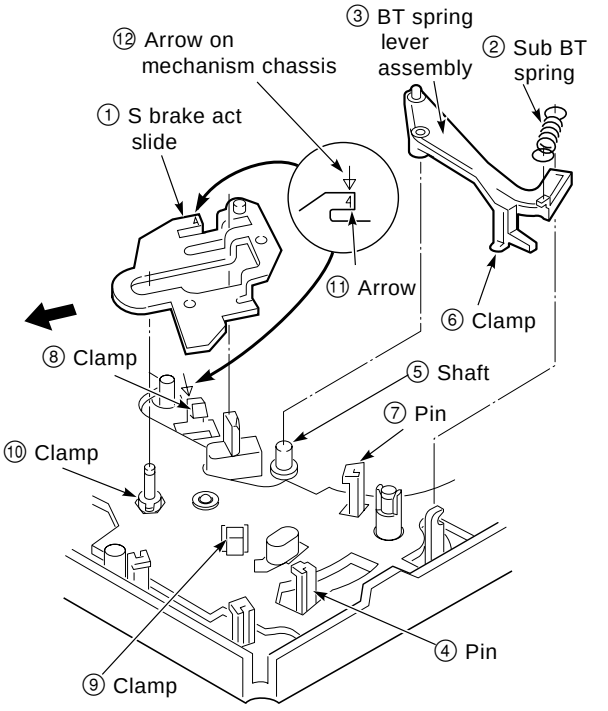


Fig. 3-13-3

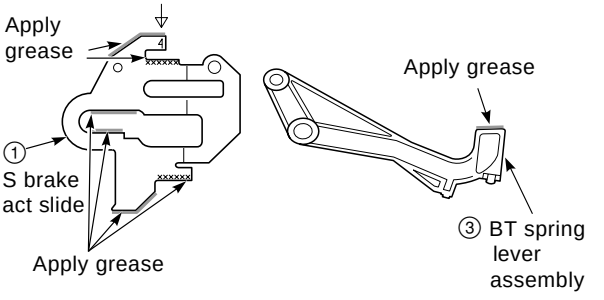


Fig. 3-13-4

3-14. Guides

3-14-1. Guide Roller Assembly

1. Unscrew the two screws ①. When you do this, be careful not to damage the cylinder or the video head.
2. Remove the two guide roller assemblies ② by unscrewing them counterclockwise.

Assembly Notes:

1. Tighten the two screws ① to a torque of 600 g•cm. After tightening, apply a screw-locking glue.
2. After replacing the parts, be sure to clean the guide roller and carry out tape path adjustment as described in Section 4-3.

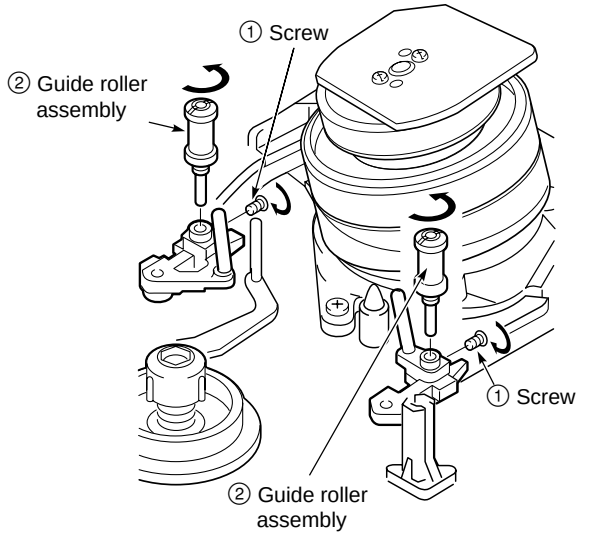


Fig. 3-14-1

3-14-2. S and T Incline Mounting Assemblies

1. Refer to Section 3-2 and remove the mechanism unit.
2. Refer to Section 3-5-2 and remove the cylinder unit.
3. Refer to Section 3-1 and rotate the loading motor in the PLAY direction until tape loading is completed.
4. Shift the S incline mounting assembly ① slightly, in the direction of the arrow Ⓐ, then remove it from the S load lever assembly ②.
5. Shift the T incline mounting assembly ③ slightly, in the direction of the arrow Ⓑ, then remove it from the T load lever assembly ④.

Assembly Notes:

1. Apply grease (VHJ-0100) to the rail (top, underside and sides) on the mechanism chassis.
2. When fitting the S and T incline mounting assemblies ① and ③ into the rail, turn the loading motor manually in the EJECT direction. When tape unloading begins, watch out in case the S and T incline mounting assemblies ① and ③ get caught in the rail.
3. After replacing the parts, clean the cylinder and the roller guide, then adjust the tape path as described in Section 4-3.

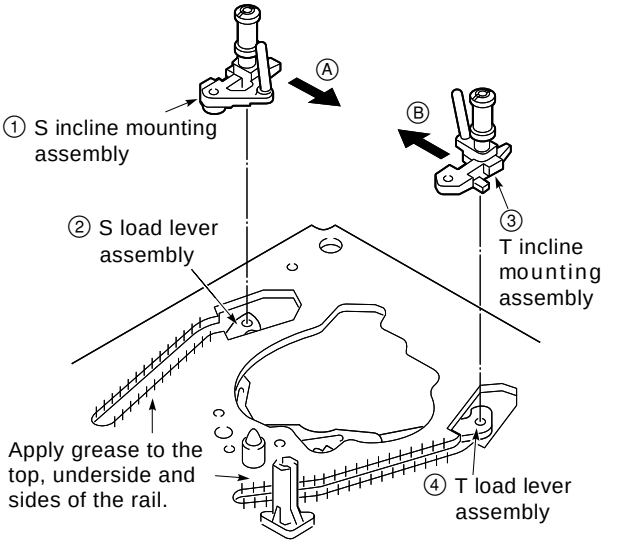

Ⓐ
Ⓑ
① S incline mounting assembly
② S load lever assembly
③ T incline mounting assembly
Apply grease to the top, underside and sides of the rail.
④ T load lever assembly

Fig. 3-14-2

3-15. Wheel Gear 2, Main Cam and OPT Pinch Relay Gear

1. Refer to Section 3-2 and remove the mechanism unit. When you do this, make sure the mechanism is in EJECT mode.
2. Remove the clamp ①, then remove the wheel gear 2 ②.
3. Remove the washer ③, then remove the main cam ④.
4. Remove the clamp ⑤, then remove the OPT pinch relay gear ⑥.

Assembly Notes:

1. Apply grease (VHJ-0100) to the shafts ⑦, ⑧ and ⑨, to the teeth of the main cam ④, and to the all over the cam groove of main cam ④.
2. When fitting the OPT pinch relay gear ⑥, align it in Ⓐ Ⓑ order as shown in Fig. 3-15-2. The alignment of the part Ⓑ is shown in Fig. A. Position the teeth of the OPT pinch relay gear ⑥ so that the sixth tooth space left of part Ⓐ is aligned with the triangular mark on the pinch cam gear ⑩. After aligning part Ⓑ, refer to Section 3-9-2 and check the positioning of the OPT pinch relay gear, the pinch cam gear and the pinch lift cam.
3. Align the hole in the crescent slide ⑪ with the hole in the mechanism chassis, as shown at point Ⓒ in Fig. 3-15-2 (refer to Section 3-16 and see the holes ⑥ and ⑦ in Fig. 3-16-1).
4. When fitting the main cam ④, position the OPT pinch relay gear ⑥ and the front rack gear ⑫ as shown at points Ⓓ and Ⓔ respectively in Fig. 3-15-2.
5. When fitting the gear wheel 2 ②, position the main cam ④ and the wheel gear 1 ⑬ as shown at points Ⓕ and Ⓖ respectively in Fig. 3-15-2.

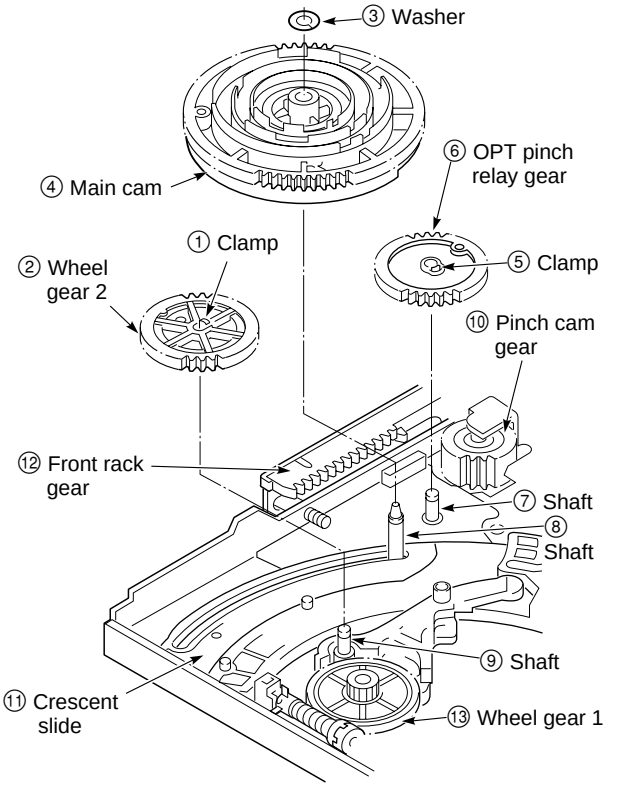


Fig. 3-15-1

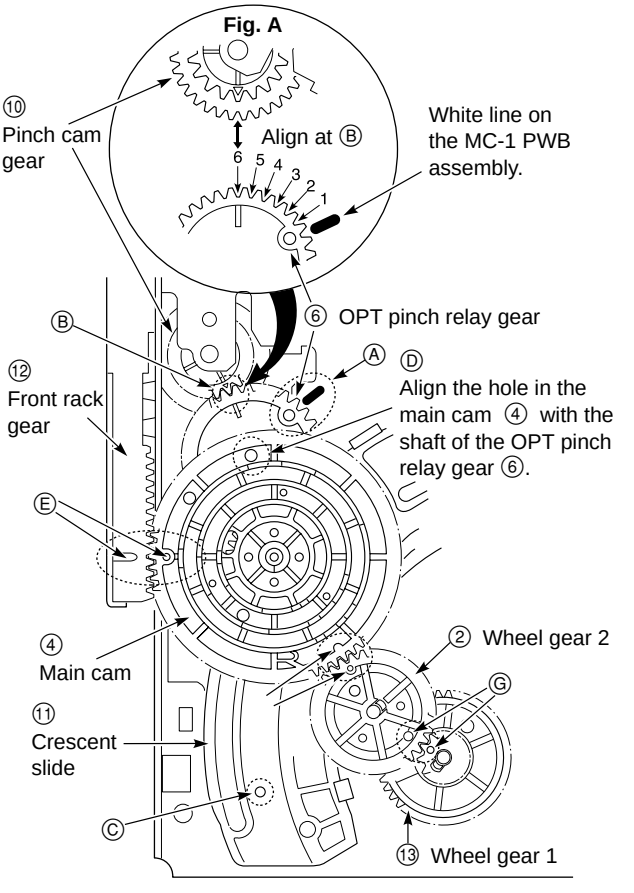


Fig. 3-15-2

3-16. Crescent Slide

1. Refer to Section 3-2 and remove the mechanism unit. When you do this, make sure the mechanism is in EJECT mode.
2. Refer to Section 3-3-1 and remove the cassette mechanism assembly.
3. Refer to Section 3-7-2 and remove the capstan brake assembly.
4. Refer to Section 3-12-4 and remove the T soft brake assembly.
5. Refer to Section 3-13-1 and remove the T brake act slide.
6. Refer to Section 3-12-1, then remove the reel belt and the reel pulley.
7. Refer to Section 3-15, then remove the wheel gear 2 and the main cam.
8. Refer to Section 3-13-2, then remove the wheel gear 1 and the brake control lever.
9. Remove the two screws ①, then remove the crescent mounting ②.
10. Remove the clamps ③, then raise the right end of the crescent slide ④ slightly. Slide the crescent slide ④ to the right until it comes away from the clamp ⑤, then remove it.

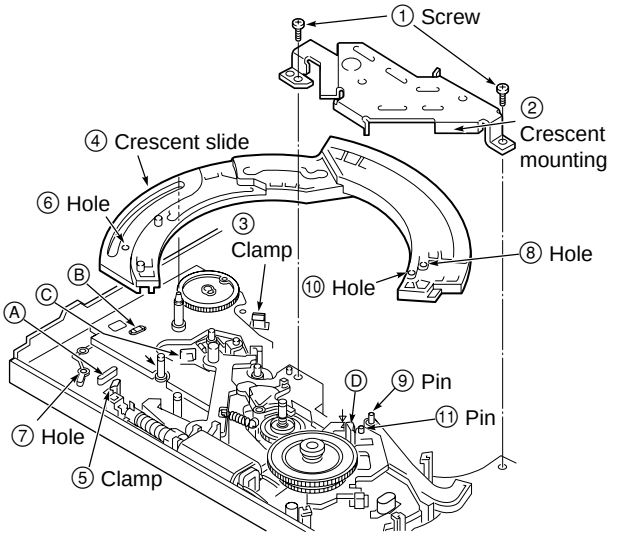


Fig. 3-16-1

Assembly Notes:

1. Apply grease (VHJ-0100) to the points Ⓐ, Ⓑ, Ⓒ and Ⓓ in Fig. 3-16-1, and to the crescent slide ④ shown in Fig. 3-16-2.
2. Before fitting the crescent slide ④, refer to Section 3-13-3 and align the arrow on the S brake act slide with the arrow on the mechanism chassis. Then refer to Fig. 3-17-3 and check that the S load gear and the T load gear have completed tape unloading.
3. When assembling the parts, raise the right side of the crescent slide ④ slightly, and keeping it in this position, slot the left side into the clamp ⑤, then align the hole ⑥ with the hole ⑦ in the mechanism chassis. When you do this, check that the hole ⑧ is aligned with the pin ⑨ on the BT spring lever assembly, and that the hole ⑩ is aligned with the pin ⑪ on the S brake act slide, before pressing the crescent slide ④ into place. Check that the clamps ③ and ⑤ are engaged.
4. After assembly, check that each lever and each brake is working properly.

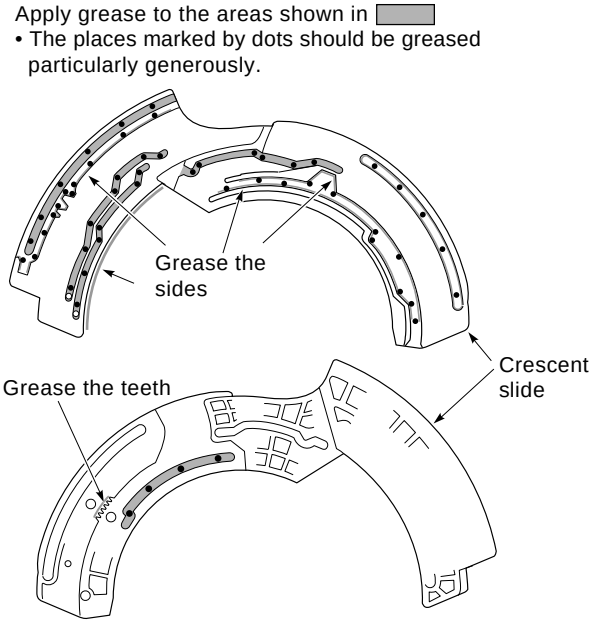

Apply grease to the areas shown in
• The places marked by dots should be greased particularly generously.
Grease the sides
Crescent slide
Grease the teeth

Fig. 3-16-2

3-17. S Load Gear, T Load Gear, S Load Lever Assembly and T Load Lever Assembly

1. Refer to Section 3-16 and remove the crescent slide.
2. Refer to Section 3-14-2 and remove the S and T incline mounting assemblies.
3. Remove the clamp ①, then remove the components: the S load gear ②, the S load spring ③ and the S load lever assembly ④. When you do this, be careful not to damage the clamp ①, which can be damaged easily. Again, be careful when you disassemble the components, as the S load spring ③ will spring out.
4. Remove the following components: the T load gear ⑤, the T load spring ⑥, and the T load lever assembly ⑦. Be careful when you disassemble the components, as the T load spring ⑥ will spring out.

Assembly Notes:

1. Apply grease (VHJ-0100) to the shafts ⑧, ⑨ and parts A shown in Fig. 3-17-1. Then apply grease (VHJ-0100) to the parts shown in Fig. 3-17-2.
2. When fitting the S load gear ② and the T load gear ⑤ align them in the tape-loaded state, as shown in Fig. A in Fig. 3-17-3. Again, after completing tape-unloading on these gears, check that they are positioned as shown in Fig. B in Fig. 3-17-3, then refer to Section 3-14-2 and fit the S and T incline mounting assemblies.

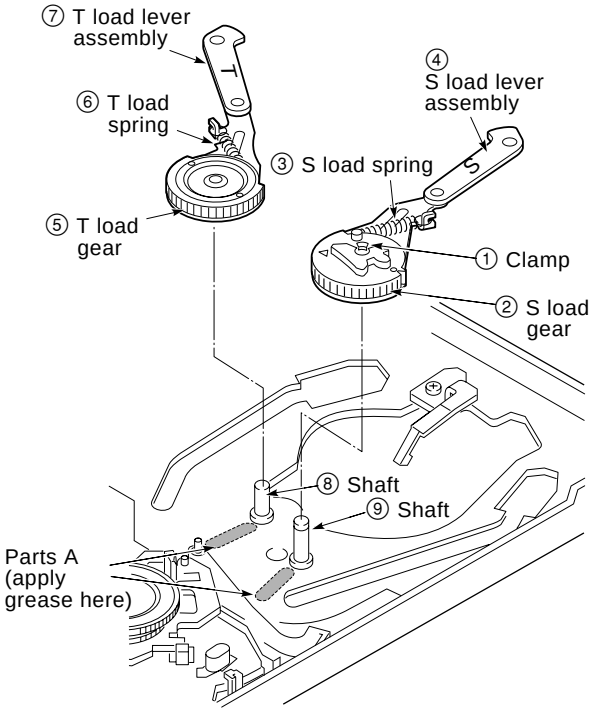


Fig. 3-17-1

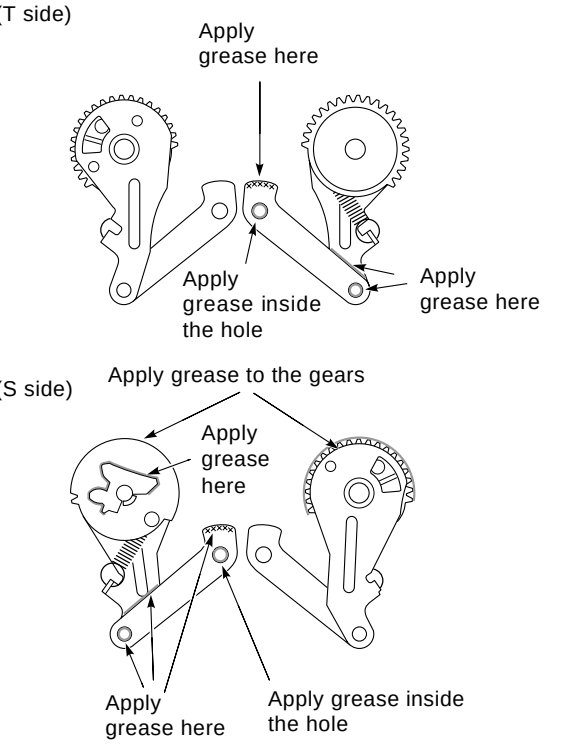


Fig. 3-17-2

Fig. A: When tape loading is complete

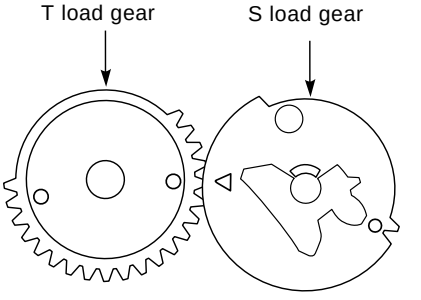


Fig. B: When tape unloading is complete

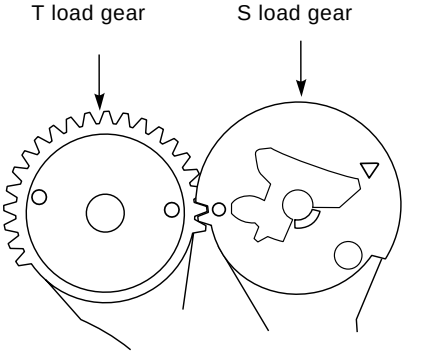


Fig. 3-17-3

3-18. Tape Sensors, Reel Sensor and EP SW Lever

3-18-1. Tape Top Sensor and Tape End Sensor

1. Refer to Section 3-2 and remove the mechanism unit.
2. Refer to Section 3-3-1 and remove the cassette mechanism assembly.
3. Remove the soldering from the MC-1 PWB assembly, then remove the photo diodes ①, ② and the LED ③. When removing the photo diode ② on the tape top sensor side, refer to Section 3-15 and remove the main cam.

Assembly Notes:

1. Fit the photo diodes ① and ② so that their photoreceptors to face the LED ③, as shown in Fig. 3-18-1. Align the cuts in the LED ③ and the holder ④. Push the photo diodes ①, ② and the LED ③ as far down as they will go, so that they do not protrude above the top of their holders.
2. Do the soldering quickly.

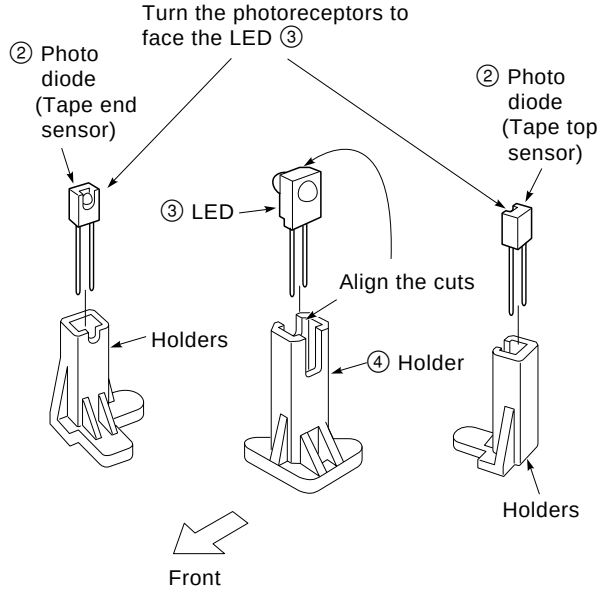


Fig. 3-18-1

3-18-2. Reel Sensor

1. Refer to Sections 3-12-2 and 3-12-4, then remove the clutch mounting assembly, the T soft brake assembly and the take up reel assembly.
2. Refer to Section 3-13-2, then remove the wheel gear 2, the wheel gear 1, and the brake control lever.
3. Remove the soldering from the MC-1 PWB assembly, then remove the photo diode (reel sensor) ①.

Assembly Notes:

1. When assembling the parts, align the cut on the photo diode (reel sensor) ① with the protrusion on the mechanism chassis ②.
2. Do the soldering quickly.

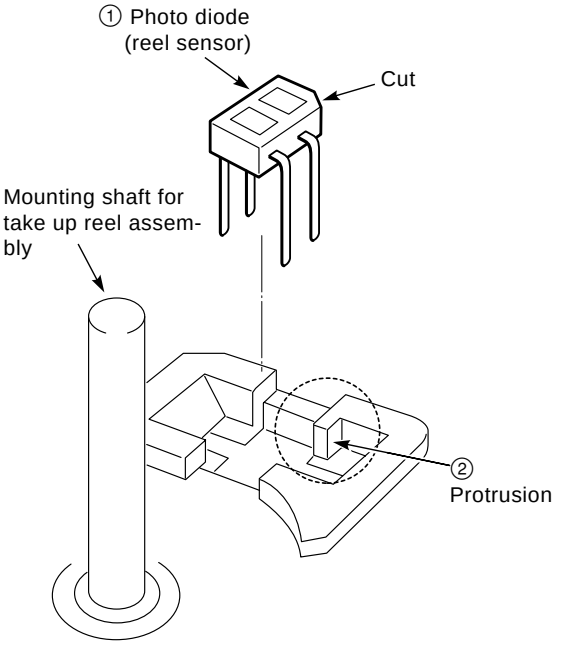


Fig. 3-18-2

3-18-3. EP Switch Lever

1. Refer to Section 3-3-1 and remove the cassette mechanism assembly.
2. Remove the EP switch spring ①.
3. Remove the clamp ②, then remove the EP switch lever ③.

Assembly Notes:

1. Apply grease (VHJ-0100) to the protrusion ④ on the back of the EP switch lever ③.
2. After fitting the cassette mechanism assembly, check that in EJECT mode, the EP switch lever ③ does not touch the EP switch ⑤.

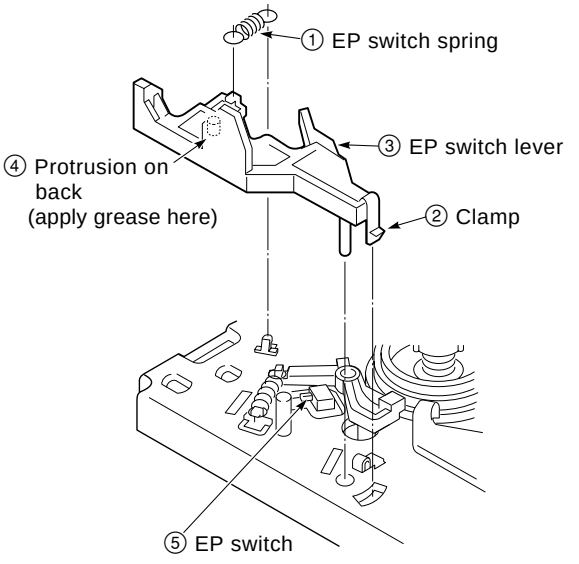


Fig. 3-18-3

4. Mechanism Checks and Adjustments

4-1. Reel Table Torque Check

1. With the power switch turned OFF, stick black vinyl tape over the photo diodes of the tape sensors. Then turn the power switch ON. Front loading will begin. Refer to Section 3-2 and Fig. 3-2-2, and release the locks of the tray lock lever and the lid opener lever.

Notes

- The measurements must be taken without any incandescent light or daylight.
- If the mechanism cannot be put into PLAY, FF or REW mode by the method described in 1) above, make a dummy cassette tape, as shown in Fig. 4-1-2. The dummy cassette tape is made as follows: Unscrew the five screws on the underside, remove the reels, leaf springs and other parts on the supply and take up sides, make holes in the upper surface as wide as the reel diameter, then assemble the parts.

2. Put the mechanism into REW mode, wait at least 10 seconds, then measure the torque value of the reel table on the supply side. It should be at least 600 g•cm. Take the measurement with the torque dial gauge (VHJ-0004) held in position in your hand (lock torque).
   While taking the measurement, rotate the reel table (take up reel assembly) on the take up side with your hand so that the reel sensor does not respond.
3. After switching to FF mode, wait for at least 10 seconds and then measure the torque value of the reel table on the take up side. It should be at least 600g•cm (lock torque).
4. After switching to PLAY mode, wait for at least 10 seconds and then measure the torque value of the reel table on the take up side. It should be between 55 and 110g•cm (lock torque).

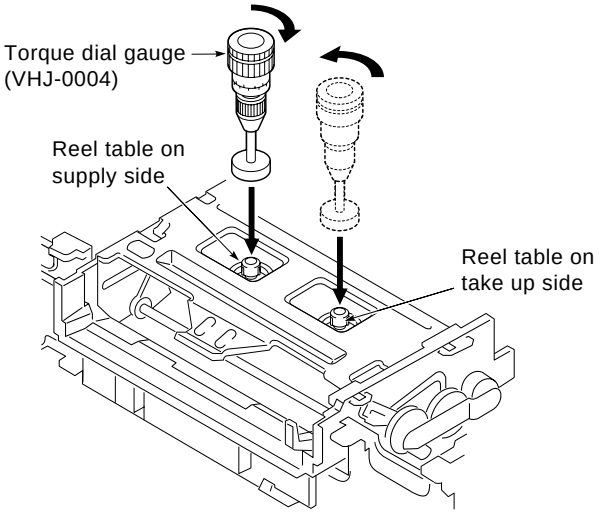


Fig. 4-1-1

5. After switching to REVIEW mode, wait for at least 10 seconds and then measure the torque value of the reel table on the supply side. It should be between 100 and 210g•cm (lock torque).

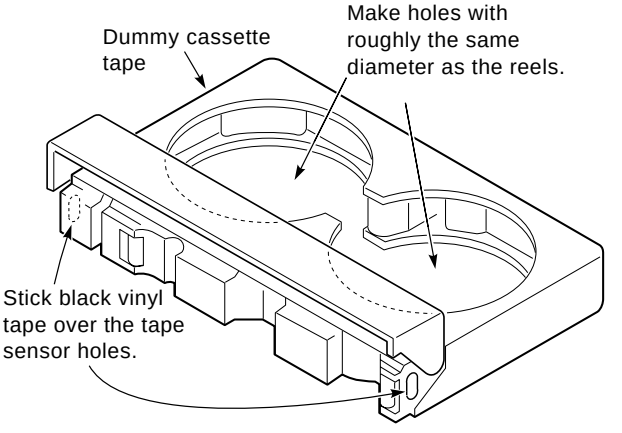


Fig. 4-1-2

4-2. Adjusting the BT Lever Assembly Position and Checking the Back Tension Torque in Play Mode

4-2-1. BT Lever Pole Position Adjustment

1. Without loading a cassette tape, put the mechanism into PLAY mode (turn the power switch OFF).
2. Adjust point Ⓐ on the band brake assembly by rotating it so that the tip of the BT lever assembly is aligned with the line on the right side of the mechanism chassis. The mechanism should be in EJECT mode when adjusting the BT Lever assembly position.
3. Refer to Section 4-2-2 and check that the back tension torque is between 25 and 50g•cm.

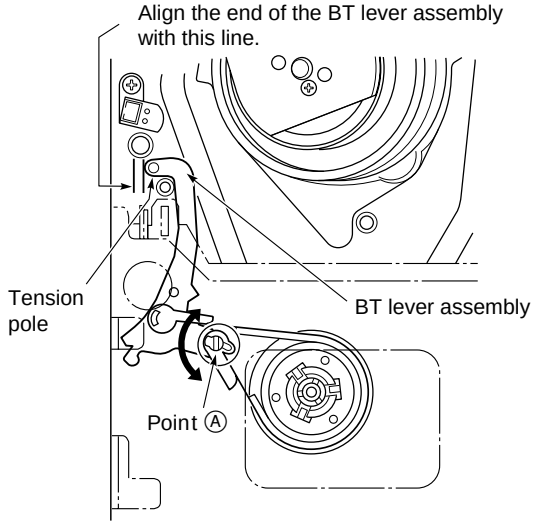


Fig. 4-2-1

4-2-2. Checking the Back Tension Torque Play Mode

1. Mount the cassette torque meter (VHJ-0016) and switch to PLAY mode.
2. Check that the back tension torque is between 25 and 50g•cm.

4-3. Tape Path Adjustment

In normal circumstances, the tape path system does not need to be adjusted. However, after removing or replacing one of the parts shown in Fig. 4-3-1, you should check and adjust the tape path. The adjustment of the tape path is carried out while monitoring the envelope waveform of the video head output, using an oscilloscope. To make sure that the tape drawn off the reel runs freely and without excessive tension along all the tape guides and cylinders (drums), it is also important to check each tape guide by eye.

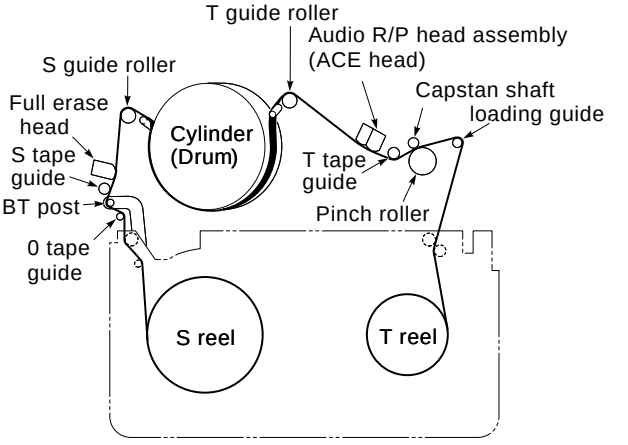


Fig. 4-3-1

4-3-1. Adjustment Procedure

1. Alignment tape or blank cassette tape, according to the transmission system of the VCR you are repairing. Models with 525 scanning lines and a field frequency of 60H
2. Clean the tape guides, the cylinder (drum), the capstan Shaft, the audio R/P head (ACE head) and the full erase head.
3. Using an oscilloscope, adjust the height of the guide roller and carry out horizontal position adjustment, height adjustment and azimuth adjustment on the audio R/P head (ACE head). When observing the envelope waveform, bring the CH-1 probe into contact with the envelope waveform (ENV) test point, and bring the CH-2 probe into contact with the switching pulse (SW P) test point. While adjusting the tape path, set the trigger at the low side of the switching pulse (SW P) in order to observe the output waveform on the CH-1 side of the video head.

Note

The contact point for the oscilloscope varies from one model to another, so to find the correct point for your model, refer to the figure entitled “Step 5 Test point for tape path adjustment” in this section.

4. When checking the tape path by eye, use a dental mirror.

4-3-2. Load Lever Assembly Height Adjustment

1. Refer to Sections 3-9-2, and remove the opener mounting .
2. Position the height adjustment tool (VHJ-0111) ③ under the full surface of the protrusion ② on the load lever assembly ①, as shown in Fig. 4-3-2.
3. Using your fingers, gently screw the adjustment nut ④ clockwise into the nut box (VHJ-0048) ⑤ until the protrusion ② of the load lever assembly ① touches the height adjustment tool (VHJ-0111) ③ and the screw starts to feel tight. Next, loosen the adjustment nut ④ by 270 ° counterclockwise. .
4. Load a cassette tape (T-160). Wind the tape to the beginning, and repeat FF ↔ REV five times (repeat for the same portion 30 to 60 seconds).
   If the bottom edge of the tape breaks, rotate the adjustment ④ nut in the counterclockwise direction by about 90 °. Repeat FF ↔ REV five times again and check that the tape edge does not break (adjust again if it does). Next, repeat CUE ↔ REV five times and check that the tape is not damaged. If damaged, rotate the adjustment nut in the clockwise direction by about 90 °. Repeat FF ↔ REW and CUE ↔ REV and check that the tape is not damaged.

Arrange the equipment so that the whole surface of the projection on the load lever assembly is positioned over the height adjustment tool (VHJ-0111) when seen from directly overhead.

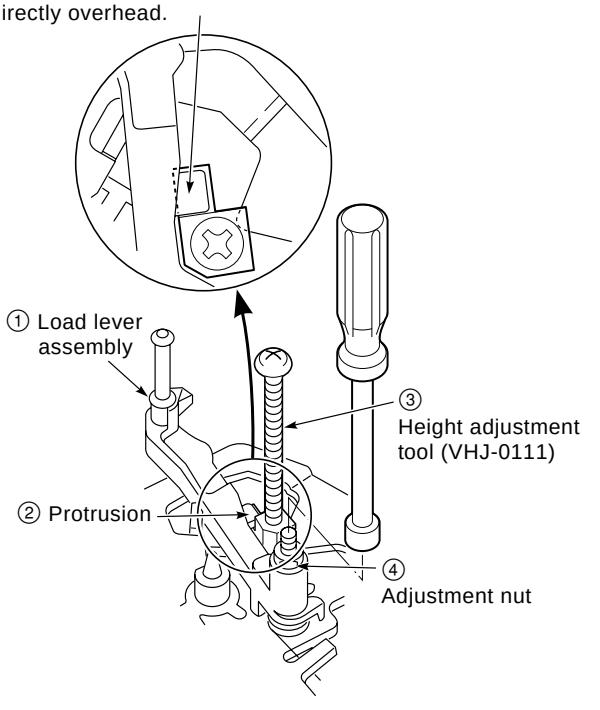


Fig. 4-3-2

4-3-3. Guide Roller Height Adjustment

1. Playback the Alignment Tape (VHJ-0006) and check that the envelope waveform is at its maximum at the tracking centre. Then, after loosening the S guide roller and the T guide roller by rotating them counter-clockwise, tighten them in turn until the envelope waveform becomes flat. If the envelope waveform is not at its maximum at the tracking centre, refer to Section 4-3-4 and carry out a rough adjustment of the horizontal position of the audio R/P head (ACE head) before adjusting the guide rollers.
2. Adjust the S guide roller.
   ① Playback the alignment tape (VHJ-0006). Press the tracking (−) button, and check whether, when the envelope waveform has reached 50 % of its maximum, the front half of the envelope waveform is flat. If not, fine-tune the S guide roller as follows.
   a. If the front half of the envelope waveform is as shown in Fig. 4-3-4 (a), this means that you have pressed the S guide roller too far. Therefore, loosen it slightly, and when it is in the state shown in Fig. 4-3-4 (b), tighten it again, stopping when the envelope waveform is flat.
   b. If the front half of the envelope waveform is as shown in Fig. 4-3-4 (b), this means you have not pressed the S guide roller far enough. Therefore, tighten it slightly, stopping when the envelope waveform becomes flat.
   c. If the front half of the envelope waveform is as shown in Fig. 4-3-4 (c), it may happen that when you tighten the S guide roller, the wrapper waveform does not disappear, but sinks into the flat part, as shown in Fig. 4-3-4 (d). If this happens, the status shown in Fig. 4-3-4 (c) is normal, so loosen the S guide roller, then tighten it again until the envelope waveform is as shown in Fig. 4-3-4 (c).
   ② Check that at the tracking centre, the output of the front half of the envelope waveform is not less than 80 % of the maximum.
   ③ Rotate the S guide roller 20 ° counterclockwise.
3. Adjust the T guide roller.
   ① Playback the alignment tape (VHJ-0006,). Press the tracking (−) button and check whether, when the envelope waveform is 50 % of maximum, the back half of the envelope waveform is flat. If not, loosen the T guide roller slightly, then tighten it gradually until the back half of the envelope waveform becomes flat.
   ② Check that the output for the back half of the envelope waveform is at its maximum at the tracking centre.
4. Check that the envelope waveform does not fluctuate when you switch from CUE to PLAY or from REV to PLAY. If the front half of the envelope waveform does fluctuate, tighten the S guide roller 1 ° to 20 °. If the back half of the envelope waveform does fluctuate, repeat steps 3 and 4.

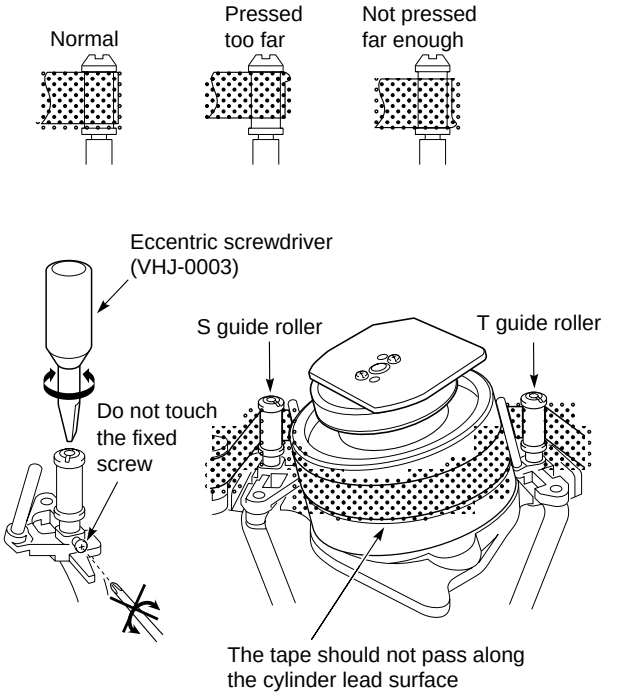

Normal
Pressed too far
Not pressed far enough
Eccentric screwdriver (VHJ-0003)
S guide roller
T guide roller
Do not touch the fixed screw
The tape should not pass along the cylinder lead surface

Fig. 4-3-3

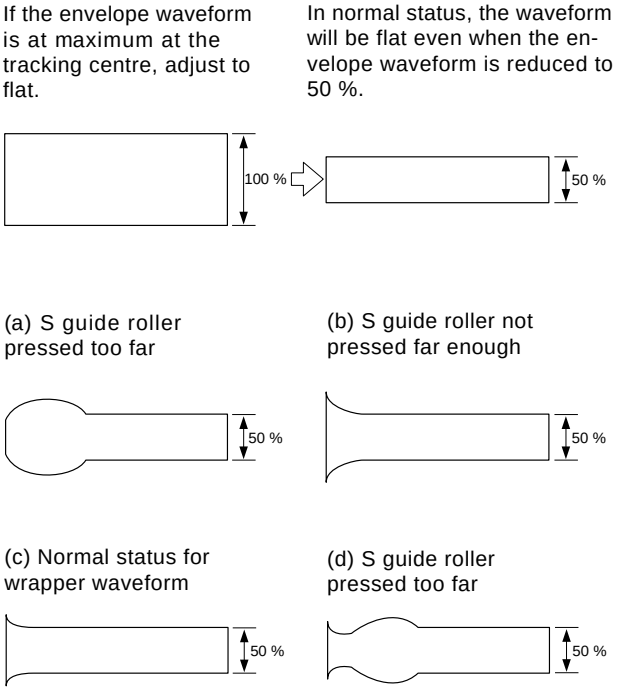

If the envelope waveform is at maximum at the tracking centre, adjust to flat.
In normal status, the waveform will be flat even when the envelope waveform is reduced to 50 %.
100 %
50 %
(a) S guide roller pressed too far
(b) S guide roller not pressed far enough
50 %
50 %
(c) Normal status for wrapper waveform
(d) S guide roller pressed too far
50 %
50 %

Fig. 4-3-4

4-3-4. Audio R/P Head (ACE Head) Height Adjustment, Azimuth Adjustment and Horizontal Position Adjustment

1. Hight/azimuth adjustment

1. Refer to Section 4-3-3, complete the GUIDE ROLLER adjustment, and perform the AUDIO R/P HEAD adjustment.
   As the audio R/P head assembly (ACE HEAD) has been temporarily adjusted before shipment, do not rotate screws unnecessarily.
2. Mark screw Ⓐ, screw Ⓑ, and bracket with a water-proof marker so that their original positions can be known even after the screws are rotated.
   Marking screws Ⓐ and Ⓑ in the same direction will enable the adjustment mentioned later to be performed easily.
3. Play the alignment tape (VHJ-0005), and observe the audio output waveform using an oscilloscope.
   Loosen screw Ⓑ in the counterclockwise direction to decrease the audio output level. Then tighten it in the clockwise direction until the maximum level. Tighten further in the clockwise direction to decrease the level, and loosen in the counterclockwise direction until the maximum level.
4. Rotate screw Ⓐ in the same direction by the same degree as screw Ⓑ in step 1. (Check visually according to the mark made.)
5. Play the alignment tape (VHJ-0006), rotate screw Ⓒ, and maximize the audio output waveform (temporary azimuth adjustment).
6. Perform the adjustments in 3 to 5 again.
7. Perform fine adjustments using screw Ⓑ.
   Perform the same adjustments as 3, and if screw Ⓑ was adjusted by more than 30 degrees, perform the adjustment in step 4 again, and then perform fine adjustments.
8. Play the alignment tape (VHJ-0006), rotate screw Ⓒ, and maximize the audio output waveform (actual azimuth adjustment)

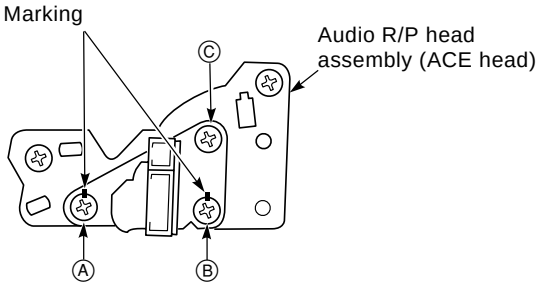


Fig. 4-3-5

2. Horizontal position adjustment

1. Play the alignment tape (VHJ-0006).
2. Press the tracking buttons (tracking + and tracking −) simultaneously and set the tracking to the centre.
3. Using an oscilloscope, observe the waveform of the video head output.
4. Loosen the two fixed screws on the audio R/P head (ACE head) by between 20 ° and 30 ° anticlockwise. .
5. Using a slotted screwdriver, adjust the position of the audio R/P head (ACE head). At the position where the amplitude of the envelope waveform is at its maximum at the tracking centre, tighten the fixed screw on the audio R/P head (ACE head). When you do this, check that the envelope waveform changes equally whether the tracking is shifted by pressing the tracking button in the plus or the minus direction.
6. Play the alignment tape (VSJ-1001) and check that the amplitude of the envelope waveform is at its maximum at the tracking centre. If not, repeat steps 1 to 6.
7. Refer to the electrical adjustments section of the service manual, and adjust the switching position of the servo circuit.

Note:

1. When you press the tracking buttons (tracking + and tracking −) simultaneously, the tracking is reset to the tracking centre. When the tracking is at the tracking centre, the message “TR -: -” will appear in place of the clock display on the front panel. If you keep pressing the tracking − button the messages “TR -: ” and “TR --: ” will appear, while if you keep pressing the tracking + button, the messages “TR : -” and “TR : --” will appear. .
2. STEP 6) applies only the model with the model for REAL TIME and the EP (LP) PLAYBACK function.

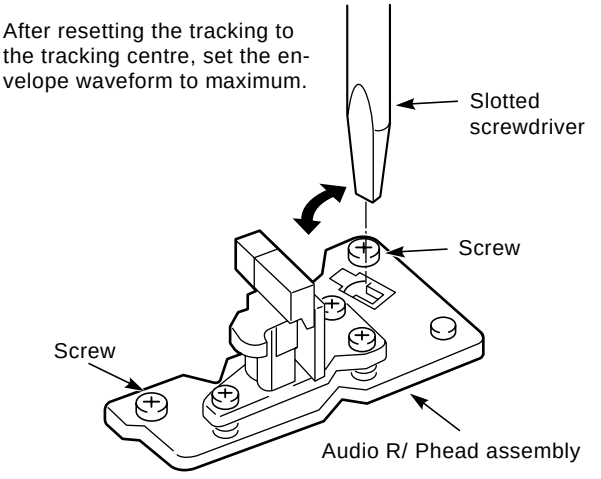

After resetting the tracking to the tracking centre, set the envelope waveform to maximum.
Slotted screwdriver
Screw
Screw
Audio R/ Phead assembly

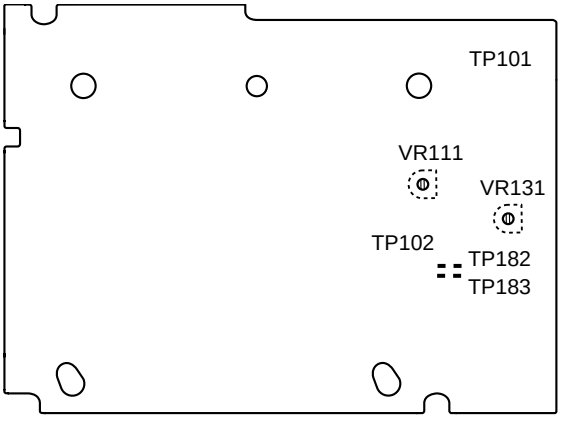
Fig. 4-3-6

4-3-5. Checking After Adjustment

1. Play the alignment tape (VHJ-0006) and check that the envelope waveform is activated immediately and that there are no fluctuations in the envelope waveform or the audio output waveform.
2. Load a cassette tape (T-120) and use it to record and replay. Check that the envelope waveform is activated immediately and that there are no fluctuations in the envelope waveform or the audio output waveform. (When recording on the tape, input 1kHz to the audio input terminal. Use a scratch-free cassette tape (T-120).)
   Check that at the tracking centre, the front half down and back half down are not more than 20 % of the value at the point where the envelope waveform amplitude is at its maximum.
3. Check that the envelope waveform is activated immediately when you switch from PLAY to REV or from REV to PLAY. Check that there is no slack in the tape next to the pinch roller.
4. Check that the envelope waveform is activated immediately when you switch to PLAY from FF, REW, CUE, REV or STOP mode. Check that there is no slack in the tape next to the pinch roller.
5. Check that the tape is not curling or riding up on the upper or lower flanges of the tape guides in PLAY, FF, REW, CUE or REV modes.
6. Check that in PLAY mode, the tape runs as shown in Fig. 4-3-7.
7. Load a tape (T-160) and play it back. carry out the checks described in steps 3 to 5 above.

5. Test Points for Tape Path Adjustment

Test points TP182 (ENV) and TP183 (SW-P) for tape path adjustment are shown in figure below.



CP-1 PWB (Foil side)

Fig. 5-1

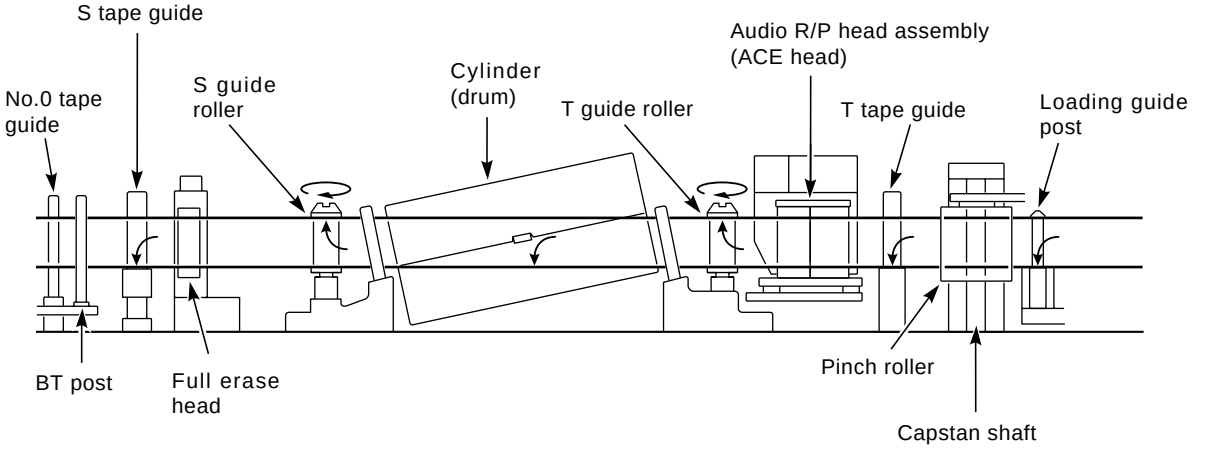


Fig. 4-3-7

Section 3
Electrical Adjustments

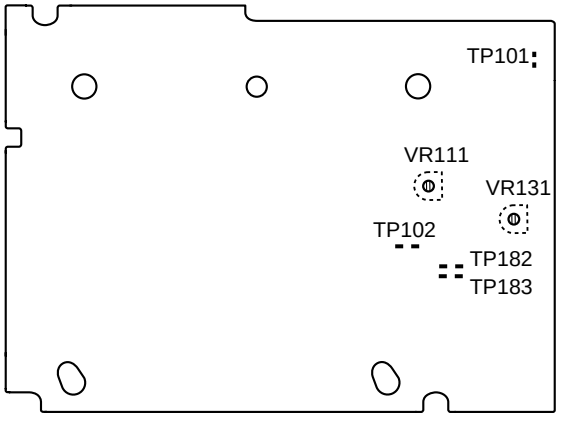
3-1. Servo Circuit Adjustment

- These adjustments should be carried out upon completion of the tape transport adjustments.
- If the tape transport adjustments (except the tilt adjustment) are done after these adjustments, follow the procedures again in Section 3-1-3. “SWITCHING POSITION ADJ.”
- When a cassette tape is loaded, auto-tracking will be set immediately after starting the first playback. As this will deviate the tracking center set, be sure to tracking center position after starting playback to prevent auto-tracking from being set.

3-1-1. Test Equipment and Standards Required

Color Bar Signal Generator	**NTSC color bar signal with 100% white level (EIA color bar signal)**
Oscilloscope	Vertical sensitivity: 5 mV/DIV, external trigger Bandwidth: more than 10 MHz
Alignment Tape	VHJ-0007: EP mode, monoscope
Blank Tape	VHS cassette tape
Monitor TV	

3-1-2. Location Of Adjustment Points



CP-1 PWB (Foil side)

Fig. 2-1-1

Notes

- Set the REC/PLAY SPEED button to indicator panel to the 8H (8 hours) mode.
- Self-recoding means “Record any broadcasting or video signal and play back the just-recorded portion”.

3-1-3. Switching Position Adj.

Measuring Point	Measuring Equipment	Adj. Condition
TP101(VIDEO OUT terminal) TP183 (SW-P)	Oscilloscope	PLAY (8 H) mode Alignment tape VHJ-0007

Adj. Condition	Adj. Condition
REC button, TRACKING buttons, EJECT button	6.5 H ±0.5 H

1. Play back the alignment tape. Press the TRACKING buttons (+) and (−) simultaneously. (TRACKING center position)
2. Press the REC button three times within 10 seconds after the display is shown. All three presses must be carried out within 3 seconds. For the third time, press the REC button more than 0.5 seconds as shown in Fig. 2-1-2.
3. The automatic adjustment mode is set, the numerals of Indicator display “P 0 : 00” changes automatically and the unit stops at the point the adjustment value becomes approx. 6.5 H.
4. In the same adjustment mode, trigger at the edge of the RF SW pulse, and check that the front edge of the V sync signal from the fall edge of the RF SW pulse is delayed by 6.5 H ± 0.5 H as shown in Fig. 2-1-3. If it is not 6.5 H ±0.5 H, manually perform fine adjustments for the TRACKING buttons (+) or (−) to satisfy the specification.
5. After completing adjustments, press the EJECT button (more than 1 second) and check the Indicator shows “P – –” at this time.

Note

Repeat steps 1 to 4 if the adjustment takes more then 20 seconds.

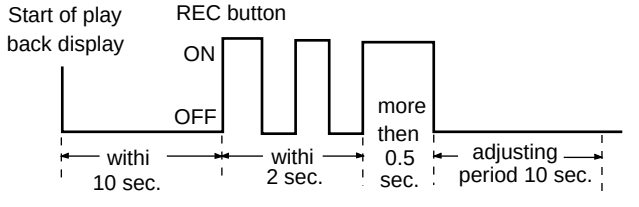


Fig. 2-1-2

3-1-4. 24 H Play Tracking Confirm and Adj.

Measuring Point	Measuring Equipment	Adj. Condition
Picture of monitor TV	Color bar generator (Monoscope pattern signal) Monitor TV	Self-recording (8 H) mode 24 H PLAY mode Blank tape

Adj. Condition	Adj. Condition
TRACKING buttons REC button	—

1. Insert blank VHS cassette tape and record monoscope pattern on the 8 H mode.
2. Play back the self-recorded tape and then set the VCR in the 24 H mode.
3. Use the front tracking adjustment button to fine-tune to the optimum position so that the positions of noise on the monitor screen at the tracking center are vertically symmetrical. Then press the REC button more than 1 second to enter this position as the new tracking center. The indication displays “P – –” for approximately 1 second.
4. If vertical shaking occurs at the tracking center, read just by pushing the TRACKING buttons (no more than 3 times), then enter this new tracking position as the tracking center.

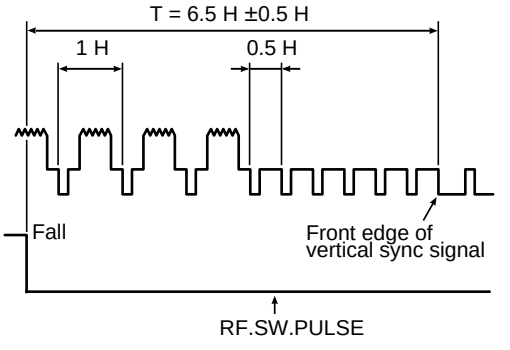


Fig. 2-1-3

3-1-5. F. Slow Tracking Confirm and Adj.

Measuring Point	Measuring Equipment	Adj. Condition
Picture of monitor TV	Color bar generator (Monoscope pattern signal), Monitor TV	Self-recording (8 H) mode, PLAY mode, Blank tape

Adj. Condition	Adj. Condition
TRACKING buttons MENU RESET button EJECT button	—

1. Insert blank VHS cassette tape and record monoscope pattern on the 8 H mode.
2. Play back the self-recorded tape and then set the VCR in the STILL mode.
3. Change to F. Slow play back mode by pressing REC button 3 times. These 3-push must be done within 3 seconds, and last push must be kept pressed for 0.5 seconds.
4. Set the tracking control position to the center by pressing TRACKING (+) and (−) buttons simultaneously, and confirm the absence of noise in the slow playback image on the monitor screen at this centered tracking position. Starting from this centered tracking position, push the (+) and (−) buttons and confirm that no noise appears before the fifth push in either direction.
   If noise appears before the fifth push, fine-tune with the front tracking adjustment button so that no noise appears before the fifth push, then press the EJECT button to make this point the new tracking center. (When pressing the EJECT button to enter this new tracking center, the tracking should be displayed.)
   The FLD counter readout changes to “P – –” for approximately 1 second in order to confirm that data has been entered.

3-2. Video Circuit Adjustment

Before making the following adjustments, complete the adjustments described in Section 3-1. “Servo Circuit.”

3-2-1. Test Equipment and Standards Required

Color Bar Signal Generator	**NTSC color bar signal with 100% white level (EIA color bar signal), monoscope signal**	
Frequency Counter		
Oscilloscope	Vertical sensitivity: Bandwidth:	5 mV/DIV, external trigger more than 10 MHz
Oscilloscope Probe	Input capacity: Covering frequency:	less than 25 pF (10:1) less than 40 pF (1:1) DC~40 MHz (10:1) DC~30 MHz (10:1)
Blank Tape	VHS cassette tape	

Note

Self-recording means “Record the video signal and play back the just-recorded portion.”

3-2-2. Comb Filter Adj.

Measuring Point	**Measuring Equipment**	**Adj. Condition**
TP102	Color bar generator Oscilloscope	E-E mode

Adj. Condition	**Adj. Condition**
VR111 (COMB)	minimum

1. Connect the color bar generator (Color bar signal with 100 % white level) to the VIDEO IN terminal.
2. Connect the Oscilloscope to TP102.
3. Adjust VR111 (COMB) so that the chroma level becomes a minimum.

3-2-3. 2 H Delay Level Adj.

Measuring Point	**Measuring Equipment**	**Adj. Condition**
TP101 or VIDEO OUT	Oscilloscope Color bar generator	Self-recording (8 H) mode STILL mode Blank tape

Adj. Condition	**Adj. Condition**
VR131 (2H-DL)	—

1. Terminate TP101 (or VIDEO OUT) and ground with a 75 Ω resistor or connect the monitor TV to the VIDEO OUT terminal.
2. Connect the color bar generator (monoscope signal) to the VIDEO IN terminal.
3. Record the color bar signal on the blank tape.
4. Play back of the just-recorded portion.
5. Adjust VR131 (2H-DL) so that the luminance signal level of switching alternately becomes the same or no flicker by monitor TV.

Section 4
Spare Parts

4-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

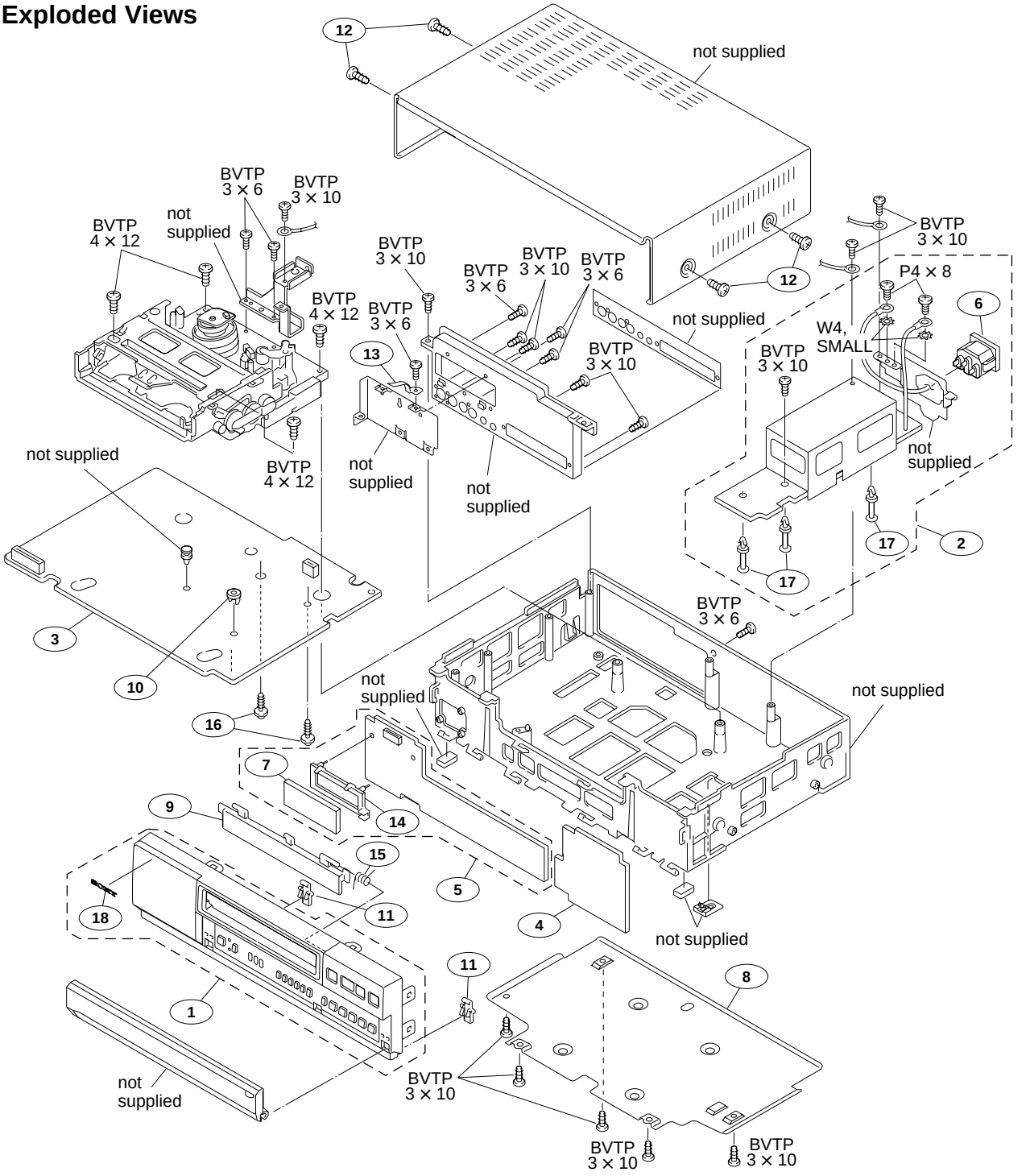
3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Harness

Harnesses with no part number are not registered as spare parts.
In need of repair, get components shown in the list and repair using them.

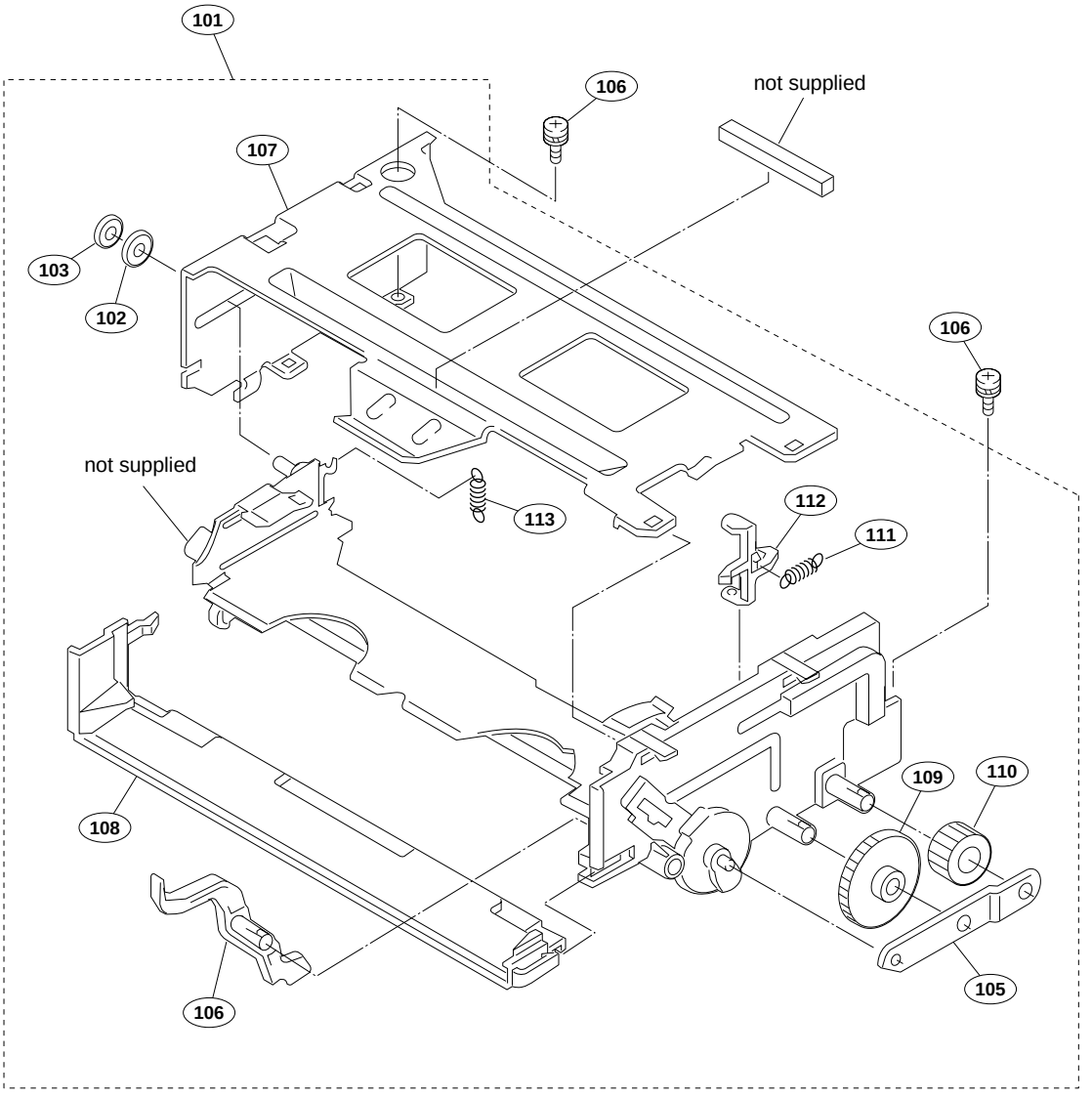
4-2. Exploded Views



No.	Part No.	SP	Description
1	A-8344-341-A	s	CABINET ASSY, FRONT
2	A-8344-343-A	s	MOUNTED CIRCUIT BOARD, PW-1
3	A-8344-344-A	s	MOUNTED CIRCUIT BOARD, CP-A
4	A-8344-348-A	s	MOUNTED CIRCUIT BOARD, TM-2
5	A-8344-347-A	s	MOUNTED CIRCUIT BOARD, TM-1(For SVT-RA168)
	A-8344-473-A	s	MOUNTED CIRCUIT BOARD, TM-1(For SVT-RA40)
6	1-251-828-11	s	SOCKET, AC INLET
7	1-518-833-11	s	INDICATOR TUBE
8	3-203-300-01	s	COVER, BOTTOM
9	3-203-326-01	s	DOOR, CASSETTE
10	3-206-683-01	s	SPACER, OPT CAM
11	3-740-330-01	s	LOCK
12	3-740-382-01	s	SCREW(4X12)
13	3-940-396-01	o	PLATE,SPRING
14	3-946-542-01	o	HOLDER
15	3-960-936-01	s	SPRING
16	3-965-446-01	s	SCREW, SPECIAL
17	3-968-578-01	s	HOLDER
18	4-942-568-01	s	EMBLEM (N0.5),SONY

SCREWS/WASHER

Part No.	SP	Description
7-682-161-09	s	SCREW +P4X8
7-685-661-19	s	SCREW +BVTP4X12(EP-FE/ZNBK/CM2
7-685-645-79	s	SCREW +BVTP3X6(EP-FE/ZNBK/CM2)
7-685-647-79	s	SCREW +BVTP3X10(EP-FE/ZNBK/CM2
7-688-004-01	s	WASHER W4 SMALL

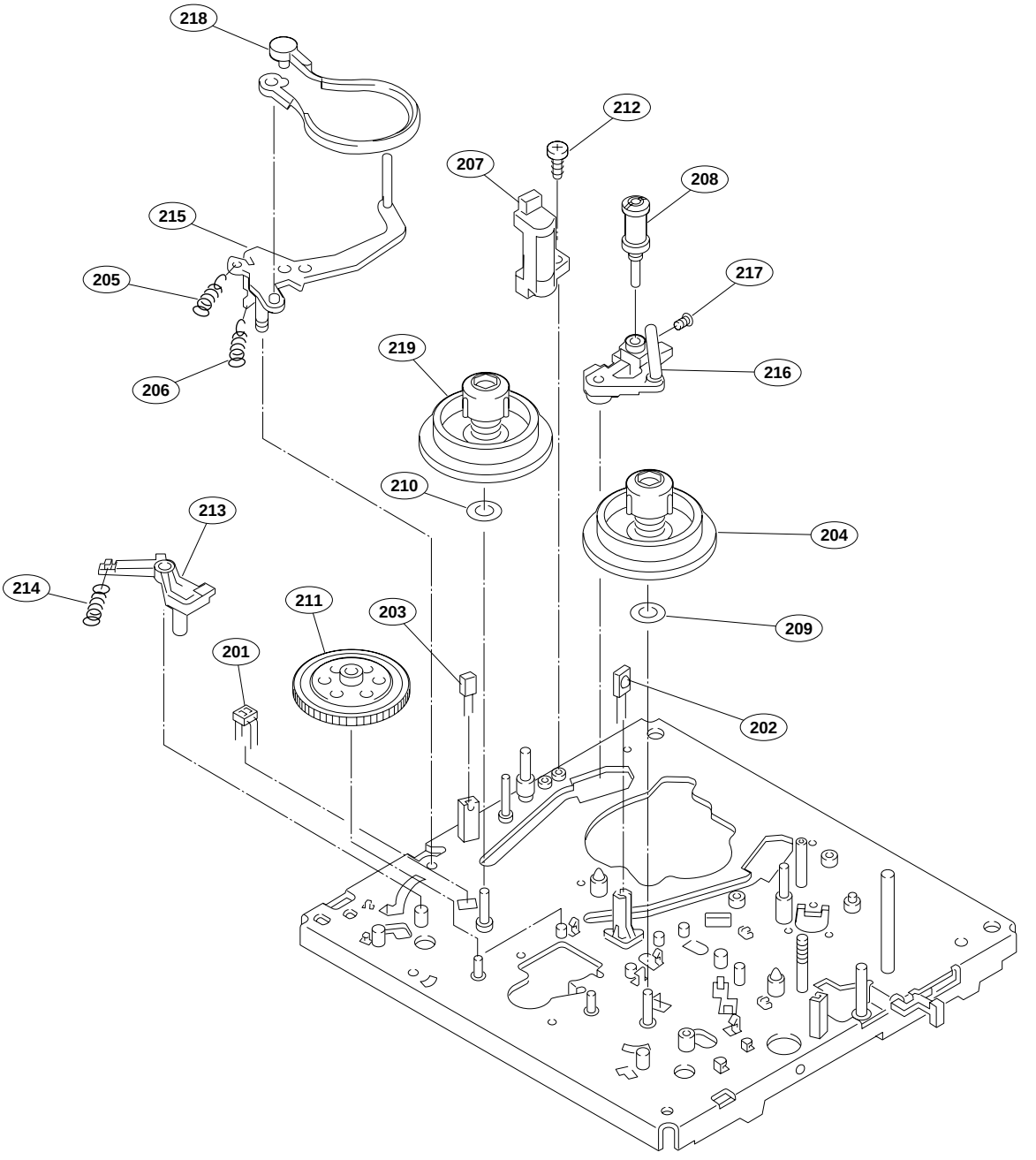


No.	Part No.	SP	Description
101	A-8321-974-A	o	MECHANICAL ASSY, CASSETTE
102	3-202-102-01	s	WASHER (F)
103	3-735-759-01	s	WASHER (3) (PLA)
104	3-960-915-01	s	LEVER, DOOR OPENER
105	3-960-916-01	o	HOLDER, GEAR
106	3-960-939-01	s	SCREW (2.6X6), SPECIAL
107	3-960-952-01	o	STAND (L)
108	3-960-954-01	s	FRAME, LOWER
109	3-960-959-01	s	GEAR, LOCK
110	3-960-960-01	s	GEAR, PINION
111	3-961-301-01	s	SPRING,LID OPENER
112	3-961-302-01	s	LEVER,RELEASE
113	3-961-303-01	s	SPRING,TRAY LOCK

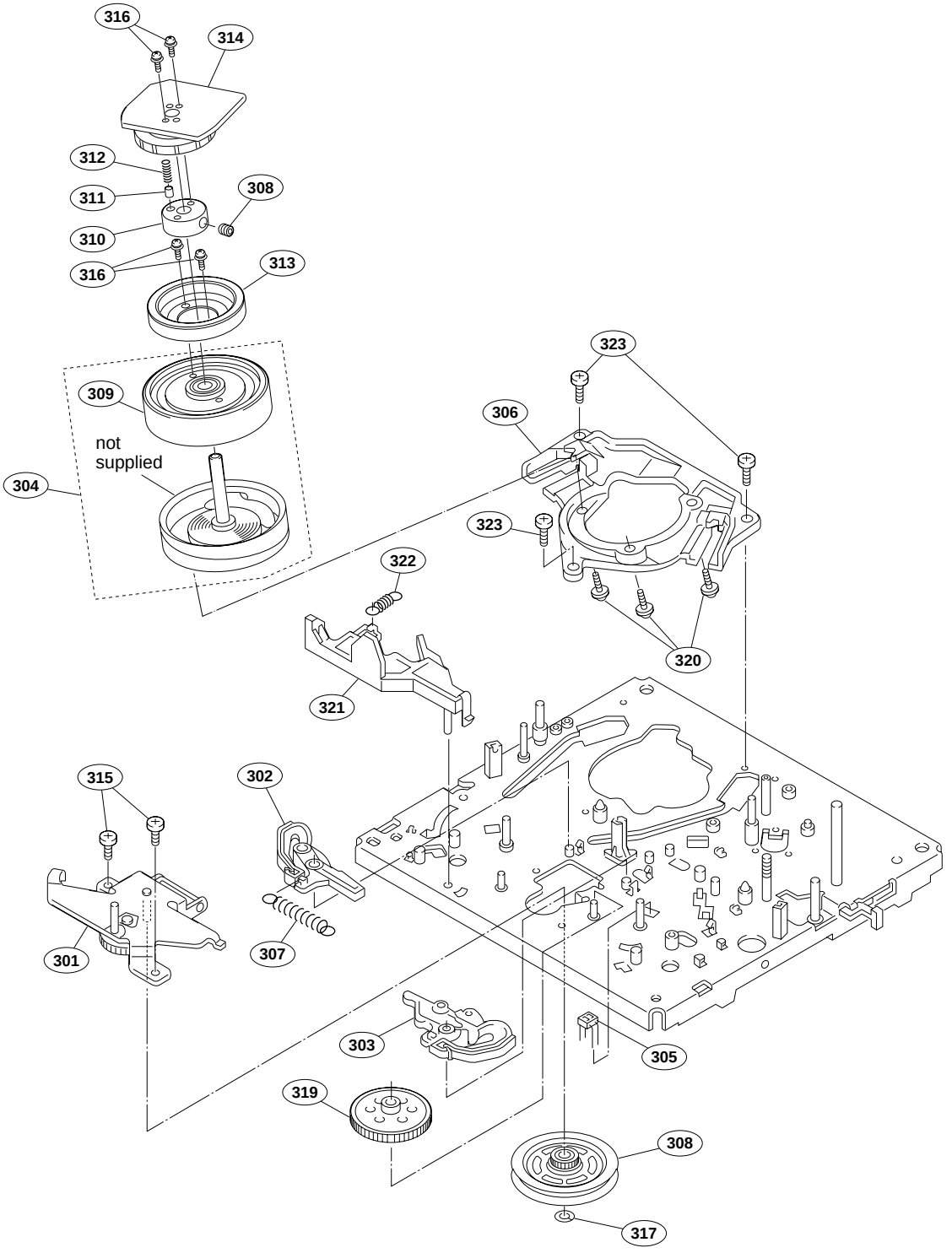
SCREW

Part No.	SP	Description
7-685-647-79	s	SCREW +BVTP3X10(EP-FE/ZNBK/CM2

Mechanism Deck Section 2

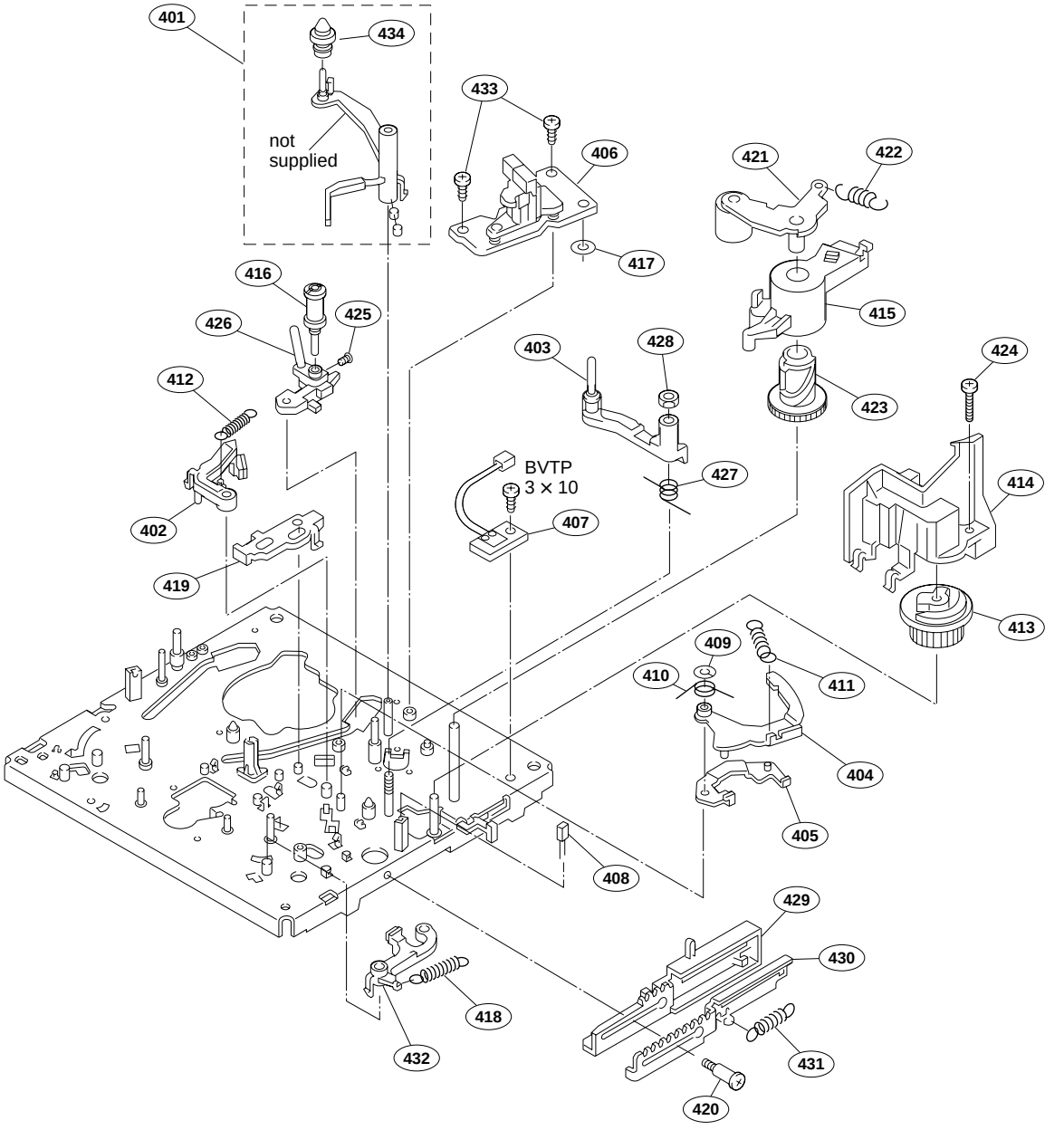


No.	Part No.	SP	Description
201	1-801-326-11	s	PHOTO COUPLER SG-105F
202	1-810-690-11	s	LED LN59L
203	1-810-691-11	s	PHOTO DIODE PN263L-NC
204	3-053-961-01	s	REEL (ASSY), TAKE UP
205	3-193-650-01	s	SPRING, BT (TL)
206	3-193-651-01	s	SPRING, BT SUB (TL)
207	3-193-669-01	s	HEAD, ERASE (FULL)
208	3-735-630-01	s	ROLLER ASSY,GUIDE
209	3-735-754-01	s	WASHER, ADJ (PLA)
210	3-735-760-01	s	WASHER,SPECIAL (3) (PLA)
211	3-960-927-01	s	GEAR, S REEL
212	3-960-984-01	s	SCREW (2.6X10), SPECIAL
213	3-961-002-01	s	LEVER, S SOFT
214	3-961-003-01	s	SPRING, S SOFT
215	3-961-016-01	s	LEVER ASSY, BT
216	3-961-037-01	s	MOUNT ASSY, S INC LINE
217	3-961-038-01	s	SCREW (2X3), SPECIAL
218	3-963-789-01	s	BAND (ASSY), BRAKE
219	3-977-065-01	s	REEL, SUPPLY (ASSY)



No.	Part No.	SP	Description
301	A-8316-756-A	s	MOUNT (COMPLETE PWB) ASSY
302	A-8325-366-A	s	BRAKE (S90) ASSY
303	A-8325-367-A	s	BRAKE (T90) ASSY
304	A-8344-339-A	s	CYLINDER COMPLETE ASSY
305	1-801-326-11	s	PHOTO COUPLER SG-105F
306	3-193-652-01	s	CYLINDER, MOUNTING
307	3-203-992-01	s	SPRING, BRAKE (90)
308	3-206-563-01	s	SCREW (4X6)
309	3-206-564-01	s	CYLINDER (UPR)
310	3-206-565-01	s	MOUNT, MOTOR CYLINDER
311	3-206-679-01	s	GROUND, CYLINDER CHIP
312	3-206-680-01	s	SPRING, CYLINDER GROUND
313	3-206-681-01	s	MOTOR, CYL DC2W ROTOR
314	3-206-682-01	s	MOTOR, CYLDC2WVN STARTER
315	3-686-999-01	s	SCREW +B(2.6X4)(ZNBK/CM2) (ST)
316	3-746-760-01	s	SCREW(2.3X6), SPECIAL
317	3-948-603-01	s	WASHER,SPECIAL
318	3-960-926-01	s	PULLEY, REEL
319	3-960-928-01	s	GEAR, T REEL
320	3-960-980-01	s	SCREW (2.6X7), SPECIAL
321	3-961-022-01	s	LEVER, EP SWITCH
322	3-961-023-01	s	SPRING, EP SWITCH
323	3-961-033-01	s	SCREW (2.6X8), SPECIAL

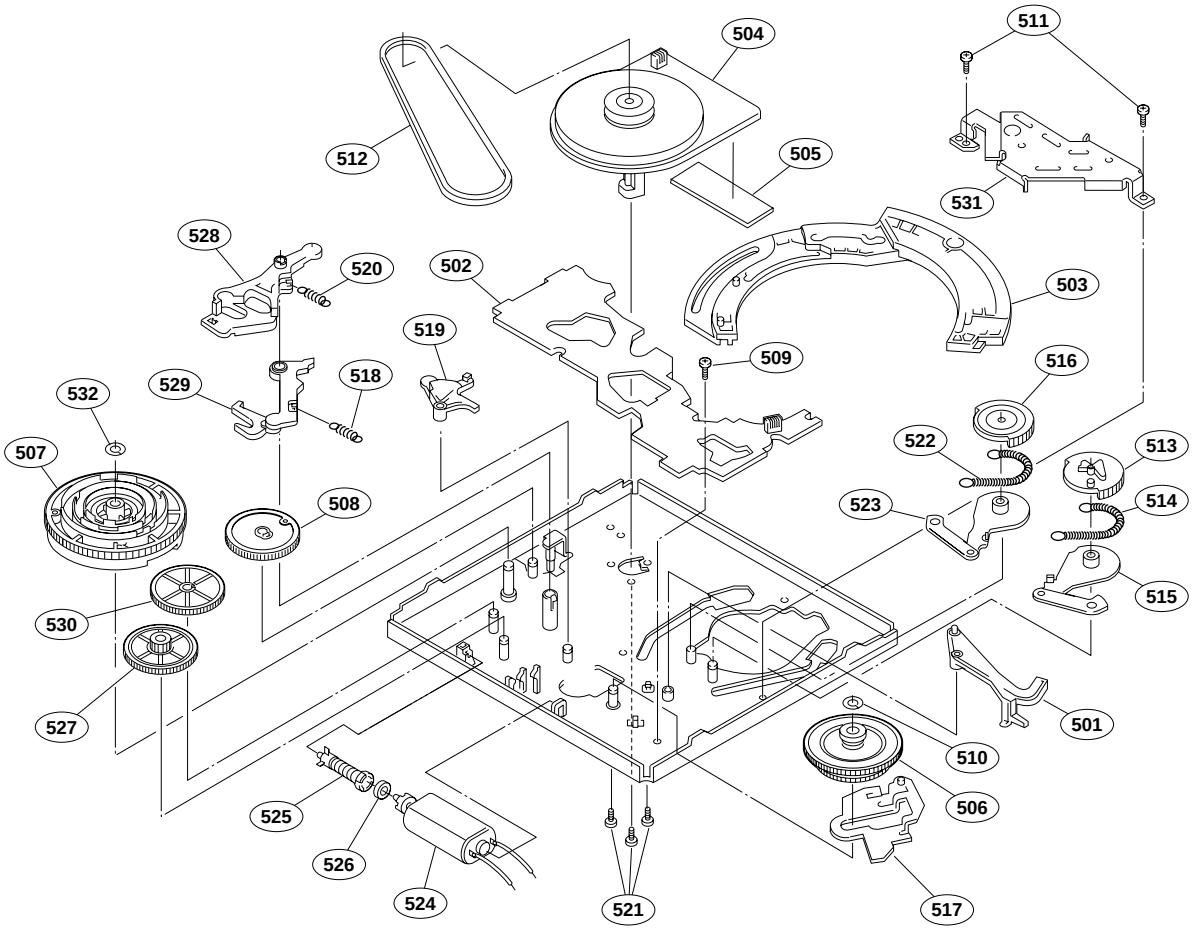
Mechanism Deck Section 4



No.	Part No.	SP	Description
401	A-6779-889-A	s	LEVER (COMPLETE PWB) ASSY
402	A-8315-818-A	s	BRAKE ASSY, CAPSTAN (TL)
403	A-8315-819-A	s	ROAD (TL) ASSY, LEVER
404	A-8315-820-A	s	GUIDE (TL) ASSY, LEVER (ACTL)
405	A-8315-821-A	s	STOPPER (TL) ASSY, LEVER
406	A-8344-338-A	s	HEAD ASSY, R/P ACE
407	A-8345-084-A	s	R-SPECIAL, DEW ASSY
408	1-810-691-11	s	PHOTO DIODE PN263L-NC
409	3-193-570-01	s	SLIT, 2.6X8X0.50 WASHER
410	3-193-648-01	s	SPRING, ACTL GUIDE (TL)
411	3-193-649-01	s	SPRING, STOPPER (TL)
412	3-200-395-01	s	SPRING, CAPSTAN BRAKE
413	3-203-303-01	s	GEAR, PINCH CAM (JG)
414	3-203-304-01	s	MOUNTING, OPENER (JG)
415	3-204-110-01	s	MOUNT (ASSY), LIFT (JG)
416	3-735-630-01	s	ROLLER ASSY,GUIDE
417	3-735-760-01	s	WASHER,SPECIAL (3)(PLA)
418	3-961-001-01	s	SPRING, T SOFT
419	3-961-008-01	s	SLIDE, T ACT BRAKE
420	3-961-021-01	s	SCREW (2.6X6), SPECIAL
421	3-961-024-01	s	LEVER ASSY, PINCH ROLLER
422	3-961-026-01	s	SPRING, PINCH ROLLER
423	3-961-027-01	s	CAM, LIFT PINCH
424	3-961-030-01	s	SCREW (2.6X16), SPECIAL
425	3-961-038-01	s	SCREW (2X3), SPECIAL
426	3-961-039-01	s	MOUNT ASSY, T INC LINE
427	3-961-044-01	s	SPRING, L GUIDE LEVER
428	3-961-045-01	s	NUT (3X3), SPECIAL
429	3-961-305-01	s	GEAR,RACK,FRONT
430	3-961-306-01	s	GEAR,RACK,START
431	3-961-307-01	s	SPRING,RACK,FRONT
432	3-963-784-01	s	BRAKE (ASSY), SOFT
433	3-966-763-01	s	SCREW (2.6X12)
434	3-977-067-01	s	CLEANER (ASSY)

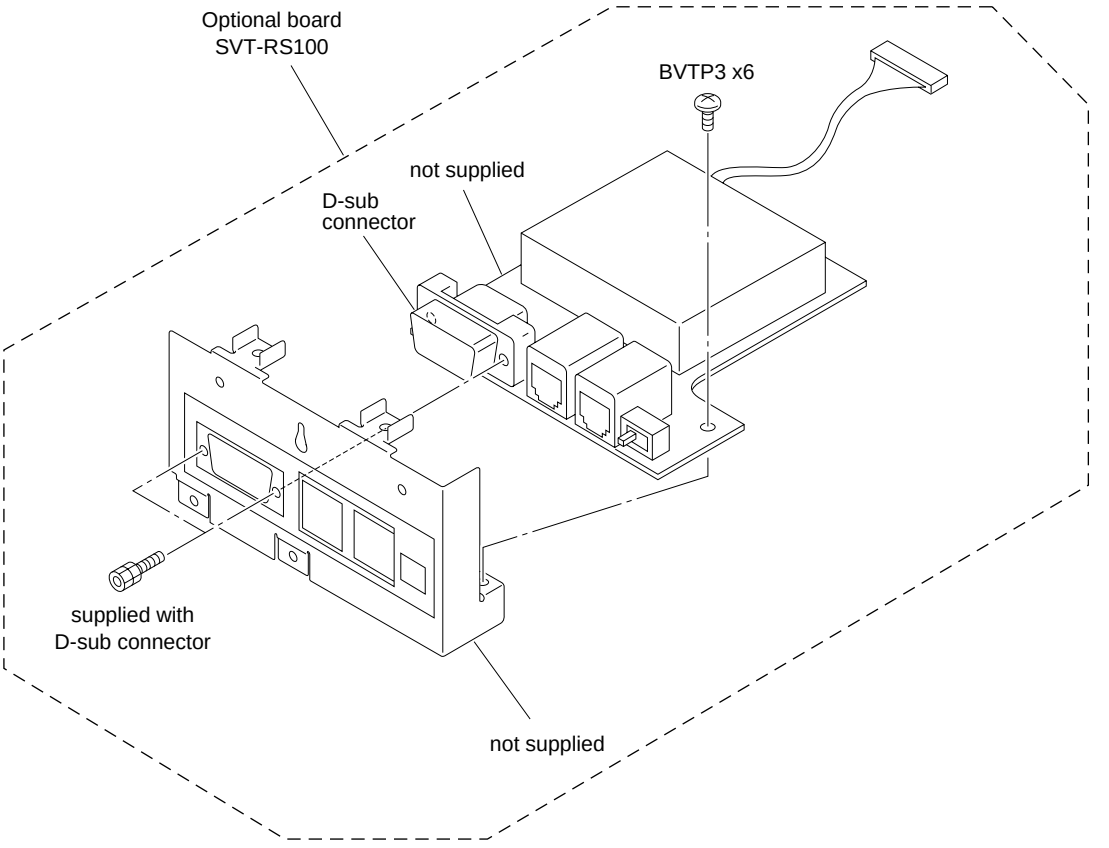
SCREW

Part No.	SP	Description
7-685-647-79	s	SCREW +BVTP3X10(EP-FE/ZNBK/CM2

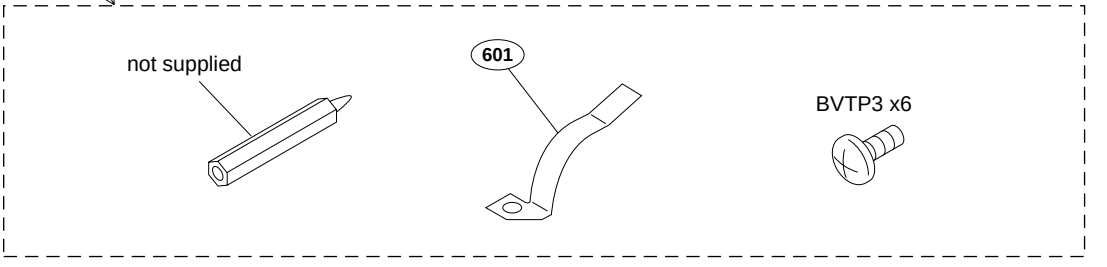


No.	Part No.	SP	Description
501	A-8315-822-A	s	SPRING (BT TL) ASSY, LEVER
502	A-8321-980-A	o	MOUNTED CIRCUIT BOARD, MC-1
503	3-203-305-01	s	SLIDE, CRESCENT (JG)
504	3-203-331-01	s	MOTOR, CAPSTAN (VN) DC (3W)
505	3-204-271-01	s	SPACER, HEAT TRANSFER
506	3-960-922-01	s	GEAR (ASSY), FRICTION
507	3-206-567-01	s	CAM, OPT (R)
508	3-206-568-01	s	GEAR, RELAY PINCH OPT
509	3-686-999-01	s	SCREW +B(2.6X4)(ZNBK/CM2) (ST)
510	3-735-755-01	s	WASHER (2.6) (PLA)
511	3-960-921-01	s	SCREW (2.6X6), SPECIAL
512	3-960-929-01	s	BELT, REEL (RBR)
513	3-960-995-01	s	GEAR, S ROAD
514	3-960-996-01	s	SPRING, S ROAD
515	3-960-997-01	s	LEVER ASSY, S ROAD
516	3-960-998-01	s	GEAR, T ROAD
517	3-961-007-01	s	SLIDE, S ACT BRAKE
518	3-961-011-01	s	SPRING, BRAKE RETURN
519	3-961-012-01	s	LEVER, CLUTCH CHANGE
520	3-961-013-01	s	SPRING, CLUTCH CHANGE
521	3-961-032-01	s	SCREW (2.6X6), SPECIAL
522	3-961-035-01	s	SPRING, T ROAD
523	3-961-036-01	s	LEVER ASSY, T ROAD
524	3-961-047-01	s	MOTOR ASSY, LOADING
525	3-961-048-02	s	GEAR (COMPL), WORM
526	3-961-049-01	s	DAMPER (PLA)
527	3-961-050-01	s	GEAR (1), WHEEL
528	3-963-787-01	s	LEVER, CONTROL BRAKE
529	3-963-788-01	s	BAR (ASSY), ACT BRAKE LEVER
530	3-963-793-01	s	GEAR (2), WHEEL
531	3-963-796-01	s	MOUNT, CRESCENT (HOLDER)
532	3-973-491-01	s	WASHER (3.6X0.5), SPECIAL

Optional Board SVT-RS100



These parts are attached with SVT-RS100



No.	Part No.	SP	Description
601	3-940-396-01	o	PLATE,SPRING

SCREW

Part No.	SP	Description
7-685-645-79	s	SCREW +BVTP3X6(EP-FE/ZNBK/CM2)

4-3. Electrical Parts List

CP-A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8344-344-A	s	MOUNTED CIRCUIT BOARD, CP-A

The CP-A board inculudes the SY-A and VA-A board.

SY-A BOARD

Ref. No. or Q'ty	Part No.	SP	Description
C3001	1-165-927-11	s	CAPACITOR, CERAMIC 24PF 50V
C3002	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C3003	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C3004	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C3005	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C3006	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3007	1-164-230-11	s	CAPACITOR,CERAMIC 220PF/50V
C3008	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3009	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3011	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3012	1-124-831-11	s	CAPACITOR,ELECT 4.7MF 25V
C3013	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C3014	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C3015	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C3016	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3018	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3020	1-109-889-11	s	CAPACITOR ELECT 1MF/50V(BP)
C3021	1-109-952-11	s	CAPACITOR ERECT 0.47MF/50V(NP)
C3022	1-109-889-11	s	CAPACITOR ELECT 1MF/50V(BP)
C3023	1-109-889-11	s	CAPACITOR ELECT 1MF/50V(BP)
C3024	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3025	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3026	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3028	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3029	1-165-929-11	s	CAPACITOR, CERAMIC 0.068MF25V
C3031	1-165-929-11	s	CAPACITOR, CERAMIC 0.068MF25V
C3032	1-162-921-11	s	CAPACITOR,CERAMIC 33PF/50V CH
C3033	1-162-921-11	s	CAPACITOR,CERAMIC 33PF/50V CH
C3034	1-162-921-11	s	CAPACITOR,CERAMIC 33PF/50V CH
C3035	1-162-924-11	s	CAPACITOR,CERAMIC 56PF/50V CH
C3036	1-162-924-11	s	CAPACITOR,CERAMIC 56PF/50V CH
C3037	1-162-924-11	s	CAPACITOR,CERAMIC 56PF/50V CH
C3038	1-126-916-11	s	CAPACITOR,ELECT 1000MF/6.3V
C3039	1-124-234-00	s	CAPACITOR ELECT 22MF/16V
C3040	1-126-176-11	s	CAPACITOR,ELECT 220MF/10V
C3041	1-124-234-00	s	CAPACITOR ELECT 22MF/16V
C3043	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3044	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3045	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C3048	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3050	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3054	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C3057	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3058	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C3059	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3060	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C3061	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C3062	1-102-951-00	s	CAPACITOR,CERAMIC;50V/15PF
C3063	1-102-951-00	s	CAPACITOR,CERAMIC;50V/15PF
C3064	1-124-234-00	s	CAPACITOR ELECT 22MF/16V
C3065	1-124-234-00	s	CAPACITOR ELECT 22MF/16V
C3066	1-126-176-11	s	CAPACITOR,ELECT 220MF/10V
C3067	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3069	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3070	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C3073	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3075	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3076	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3078	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V

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Ref. No. or Q'ty	Part No.	SP	Description
C3090	1-126-935-11	s	CAPACITOR,ELECT 470MF/16V
C3101	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3102	1-124-257-00	s	CAPACITOR,ELECT 2.2MF/50V
C3103	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3104	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3105	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3106	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3110	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3121	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3123	1-164-230-11	s	CAPACITOR,CERAMIC 220PF/50V
C3130	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3131	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3132	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3133	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3134	1-124-234-00	s	CAPACITOR ELECT 22MF/16V
C3139	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3145	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C3148	1-162-964-11	s	CAPACITOR,CERAMIC 1000PF/50V B
C3149	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
D3002	1-809-070-11	s	DIODE AK04V2
D3004	8-719-901-83	s	DIODE 1SS83
D3005	8-719-991-33	s	DIODE 1SS133T-77
D3008	8-719-109-89	s	DIODE RD5.6ES-B2
D3009	8-719-109-89	s	DIODE RD5.6ES-B2
D3010	8-719-991-33	s	DIODE 1SS133T-77
D3011	8-719-991-33	s	DIODE 1SS133T-77
D3012	8-719-991-33	s	DIODE 1SS133T-77
D3013	8-719-991-33	s	DIODE 1SS133T-77
D3014	8-719-929-15	s	DIODE HZS9.1NB2
D3015	8-719-109-89	s	DIODE RD5.6ES-B2
D3016	8-719-991-33	s	DIODE 1SS133T-77
D3020	8-719-901-83	s	DIODE 1SS83
D3021	8-719-901-83	s	DIODE 1SS83
D3030	8-719-991-33	s	DIODE 1SS133T-77
D3031	8-719-991-33	s	DIODE 1SS133T-77
D3098	8-719-050-84	s	DIODE RB441Q-40T-77
D3101	8-719-901-83	s	DIODE 1SS83
D3102	8-719-901-83	s	DIODE 1SS83
D3103	8-719-921-40	s	DIODE MTZJ4.7C
D3104	8-719-110-49	s	DIODE RD18ES-B2
IC301	1-804-956-11	s	IC UPD78F4928GF-P23-3BA
IC302	1-803-991-11	s	IC PST9128NR
IC303	1-804-663-11	s	IC LB1643L
IC304	8-759-822-35	s	IC LA7116
IC305	8-759-641-36	s	IC BR24C08
IC306	1-801-356-11	s	IC MN1381-R
IC308	1-804-823-11	s	IC TC4S30F
IC309	1-803-992-11	s	IC TC4S81F
JK301	1-815-587-11	s	HOON, JACK D3.6
L3003	1-414-540-11	s	INDUCTOR 1.1UH
PC301	1-804-661-11	s	PHOTO COUPLER GPIS094HCZ
PC302	1-804-661-11	s	PHOTO COUPLER GPIS094HCZ
PC303	1-804-661-11	s	PHOTO COUPLER GPIS094HCZ
Q3001	8-729-205-97	s	TRANSISTOR 2SC3668-Y
Q3002	8-729-205-97	s	TRANSISTOR 2SC3668-Y
Q3005	8-729-205-97	s	TRANSISTOR 2SC3668-Y

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Ref. No. or Q'ty	Part No.	SP	Description
Q3012	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q3013	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q3014	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q3015	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q3016	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q3017	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q3018	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q3019	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q3020	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q3101	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q3102	8-729-027-23	s	TRANSISTOR DTA114EKA-T146
Q3103	1-803-993-11	s	TRANSISTOR DTD113ZK
Q3105	8-729-027-23	s	TRANSISTOR DTA114EKA-T146
Q3106	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q3107	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
R3001	1-216-851-11	s	RESISTOR,CHIP 330K 1/16W 1608
R3002	1-245-305-11	s	RESISTOR, CHIP 820K
R3004	1-245-304-11	s	RESISTOR, CHIP 68K
R3005	1-245-304-11	s	RESISTOR, CHIP 68K
R3006	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R3007	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R3008	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R3009	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R3010	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3011	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3012	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R3013	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R3014	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R3016	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3017	1-245-302-11	s	RESISTOR, CHIP 16K
R3018	1-245-302-11	s	RESISTOR, CHIP 16K
R3019	1-216-864-11	s	CONDUCTOR, CHIP (1608)
R3020	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3021	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3023	1-243-819-11	s	RESISTOR,CHIP 680
R3024	1-243-819-11	s	RESISTOR,CHIP 680
R3026	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3027	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R3028	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3029	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3031	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3033	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R3034	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3036	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R3037	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3038	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3039	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3040	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3041	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3042	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3043	1-216-823-11	s	RESISTOR, CHIP 1.5K 1/16W
R3044	1-249-415-11	s	RES,CARBON 680 1/4W (SMALL)
R3045	1-249-415-11	s	RES,CARBON 680 1/4W (SMALL)
R3046	1-216-851-11	s	RESISTOR,CHIP 330K 1/16W 1608
R3053	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R3055	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3056	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3061	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3062	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)

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Ref. No. or Q'ty	Part No.	SP	Description
R3063	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3064	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3065	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3066	1-216-849-11	s	RESISTOR,CHIP 220K 1/16W 1608
R3067	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3068	1-216-849-11	s	RESISTOR,CHIP 220K 1/16W 1608
R3069	1-249-413-11	s	RESISTOR,CARBON 470 1/4W SMALL
R3070	1-249-415-11	s	RES,CARBON 680 1/4W (SMALL)
R3071	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3073	1-216-848-11	s	RESISTOR,CHIP 180K 1/16 (1608)
R3074	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3075	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3077	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3078	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3079	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3080	1-216-823-11	s	RESISTOR, CHIP 1.5K 1/16W
R3081	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3082	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R3083	1-216-827-11	s	RESISTOR, CHIP 3.3K 1/16W 1608
R3084	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R3085	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3086	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3087	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3093	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3094	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3095	1-245-306-11	s	RESISTOR, CHIP 4.3K
R3096	1-245-306-11	s	RESISTOR, CHIP 4.3K
R3097	1-245-306-11	s	RESISTOR, CHIP 4.3K
R3098	1-216-828-11	s	RESISTOR, CHIP 3.9K 1/16W 1608
R3099	1-243-814-11	s	RESISTOR,CHIP 16W
R3101	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R3102	1-243-846-11	s	RESISTOR,CHIP 1.2K
R3103	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R3104 ⚠	1-212-946-11	s	RESISTOR,FUSE 3.3 1/2W
R3105	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R3106	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R3111	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3112	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3113	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3114	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3115	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3116	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3117	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3118	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3119	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3120	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3121	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3122	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3126	1-249-411-11	s	RES,CARBON 330 1/4W SMALL
R3127	1-249-401-11	s	RES,CARBON 47 1/4W (SMALL)
R3128	1-249-401-11	s	RES,CARBON 47 1/4W (SMALL)
R3130	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3131	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3133	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3134	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3135	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3136	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3137	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3138	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)

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Ref. No. or Q'ty	Part No.	SP	Description
R3139	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3140	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3141	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3144	1-216-864-11	s	CONDUCTOR, CHIP (1608)
R3145	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R3153	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3154	1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R3155	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)
R3156	1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R3157	1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R3158	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)
R3159	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)
R3160	1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R3161	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)
R3162	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3163	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R3164	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R3165	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R3166	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3167	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R3168	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R3169	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)
R3170	1-216-813-11	s	RESISTOR, CHIP 220 1/16W 1608
R3171	1-249-427-11	s	RES,CARBON 6.8K 1/4W (SMALL)
R3172	1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R3174	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
X3001	1-579-220-11	s	CRYSTAL,OSC 32KHZ
X3002	1-767-200-11	s	CRYSTAL OSC
Z3901 ⚠	1-756-091-11	o	BATTERY, CHARGE

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Ref. No. or Q'ty	Part No.	SP	Description
C1001	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1002	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1003	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1004	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C1005	1-124-229-00	s	CAPACITOR,ELECT 33MF/10V
C1006	1-124-465-00	s	CAPACITOR,ELECT 0.47MF/50V
C1008	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1009	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C1010	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1011	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1012	1-126-162-11	s	CAPACITOR,ELECT 3.3MF/50V
C1013	1-126-162-11	s	CAPACITOR,ELECT 3.3MF/50V
C1014	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1015	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1031	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1032	1-165-936-11	s	CAPACITO, CERAMIC 0.056MF 16V
C1033	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1034	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1035	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1036	1-165-933-11	s	CAPACITOR, CERAMIC 4.7P 50V
C1037	1-164-392-11	s	CAPACITOR CERAMIC 390PF/50V CH
C1038	1-164-218-11	s	CAPACITOR,CERAMIC 180PF/50V CH
C1039	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1041	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1042	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1043	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1045	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1046	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1047	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1048	1-165-932-11	s	CAPACITO, CERAMIC 0.022MF 25V
C1049	1-165-932-11	s	CAPACITO, CERAMIC 0.022MF 25V
C1050	1-165-930-11	s	CAPACITOR, CERAMIC 0.047MF 25V
C1051	1-165-932-11	s	CAPACITO, CERAMIC 0.022MF 25V
C1052	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1061	1-162-921-11	s	CAPACITOR,CERAMIC 33PF/50V CH
C1062	1-162-918-11	s	CAPACITOR,CERAMIC 18PF/50V CH
C1063	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C1067	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1075	1-162-922-11	s	CAPACITOR,CERAMIC 39PF/50V CH
C1081	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1101	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1110	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1111	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C1112	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1113	1-102-951-00	s	CAPACITOR,CERAMIC;50V/15PF
C1114	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1121	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1122	1-162-915-11	s	CAPACITOR,CERAMIC 10PF/50V CH
C1123	1-100-160-11	s	CAPACITOR, CERAMIC 30P
C1151	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1152	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1153	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1154	1-130-495-11	s	CAPACITOR,FILM 0.1MF/50V
C1155	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1156	1-162-921-11	s	CAPACITOR,CERAMIC 33PF/50V CH
C1201	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1202	1-115-789-11	s	CAPACITOR ELECT 1000MF/25V 105
C1210	1-127-550-11	s	CAPACITOR,ELECT 3.3MF/16V SOLI
C1211	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V

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Ref. No. or Q'ty	Part No.	SP	Description
C1213	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1221	1-162-918-11	s	CAPACITOR,CERAMIC 18PF/50V CH
C1222	1-162-918-11	s	CAPACITOR,CERAMIC 18PF/50V CH
C1223	1-162-918-11	s	CAPACITOR,CERAMIC 18PF/50V CH
C1224	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C1225	1-162-927-11	s	CAPACITOR,CERAMIC 100PF/50V CH
C1226	1-162-927-11	s	CAPACITOR,CERAMIC 100PF/50V CH
C1227	1-162-927-11	s	CAPACITOR,CERAMIC 100PF/50V CH
C1228	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1229	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1230	1-124-767-00	s	CAPACITOR,ELECT 2.2MF/50V(NP)
C1231	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1233	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1234	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1235	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1236	1-135-922-11	s	CAPACITOR,CERAMIC 1800P
C1238	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1241	1-124-259-11	s	CAPACITOR,ELECT 4.7MF/50V
C1242	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1251	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1253	1-165-924-11	s	CAPACITOR,CERAMIC 3300P 50V
C1254	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1255	1-165-930-11	s	CAPACITOR, CERAMIC 0.047MF 25V
C1256	1-162-924-11	s	CAPACITOR,CERAMIC 56PF/50V CH
C1257	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1301	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1302	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1303	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1304	1-124-259-11	s	CAPACITOR,ELECT 4.7MF/50V
C1305	1-124-465-00	s	CAPACITOR,ELECT 0.47MF/50V
C1306	1-162-922-11	s	CAPACITOR,CERAMIC 39PF/50V CH
C1307	1-162-916-11	s	CAPACITOR,CERAMIC 12PF/50V CH
C1308	1-162-925-11	s	CAPACITOR,CERAMIC 68PF/50V CH
C1309	1-162-925-11	s	CAPACITOR,CERAMIC 68PF/50V CH
C1310	1-162-922-11	s	CAPACITOR,CERAMIC 39PF/50V CH
C1311	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C1312	1-124-259-11	s	CAPACITOR,ELECT 4.7MF/50V
C1313	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1314	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1315	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1316	1-163-017-00	s	CAPACITOR,CHIP CERAMIC 4700PF
C1317	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1318	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1319	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1321	1-127-550-11	s	CAPACITOR,ELECT 3.3MF/16V SOLI
C1322	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1323	1-162-916-11	s	CAPACITOR,CERAMIC 12PF/50V CH
C1324	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1325	1-162-922-11	s	CAPACITOR,CERAMIC 39PF/50V CH
C1331	1-124-257-00	s	CAPACITOR,ELECT 2.2MF/50V
C1332	1-124-257-00	s	CAPACITOR,ELECT 2.2MF/50V
C1333	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1334	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1335	1-124-257-00	s	CAPACITOR,ELECT 2.2MF/50V
C1338	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1341	1-165-935-11	s	CAPACITOR,CERAMIC 0.1MF 16V
C1342	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C1343	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C1344	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V

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Ref. No. or Q'ty	Part No.	SP	Description
C1801	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C1802	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1851	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1852	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1853	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1855	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C1856	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1857	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1871	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1872	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C1873	1-165-930-11	s	CAPACITOR, CERAMIC 0.047MF 25V
C1874	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C1875	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C2001	1-124-638-11	s	CAPACITOR,ELECT 22MF/10V
C2002	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C2003	1-124-463-00	s	CAPACITOR,ELECT 0.1MF/50V
C2004	1-124-259-11	s	CAPACITOR,ELECT 4.7MF/50V
C2005	1-124-229-00	s	CAPACITOR,ELECT 33MF/10V
C2006	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C2007	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C2031	1-165-928-11	s	CAPACITOR, CERAMIC 2700P 50V
C2032	1-165-932-11	s	CAPACITO, CERAMIC 0.022MF 25V
C2033	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C2034	1-137-745-11	s	CAPACITOR,CERAMIC 1200PF
C2035	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C2036	1-165-925-11	s	CAPACITOR, CERAMIC 5600P 50V
C2037	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C2038	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C2040	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C2041	1-165-930-11	s	CAPACITOR, CERAMIC 0.047MF 25V
C2043	1-104-942-11	s	CAPACITOR,ELECT 1MF/50V(AU)
C2049	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C2071	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C2072	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C2073	1-130-973-00	s	CAPACITOR,FILM 0.022MF/100V PP
C2081	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C2082	1-165-934-11	s	CAPACITOR, CERAMIC 0.033MF 25V
C2111	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C2112	1-126-154-11	s	CAPACITOR,ELECT 47MF/6.3V(105)
C2113	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C2114	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C2115	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C2117	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C2118	1-165-601-11	s	CAPACITOR,CERAMIC 1000P 25V
C2121	1-162-927-11	s	CAPACITOR,CERAMIC 100PF/50V CH
D1002	8-719-991-33	s	DIODE 1SS133T-77
D1221	8-719-991-33	s	DIODE 1SS133T-77
D1251	8-719-109-89	s	DIODE RD5.6ES-B2
D1602	8-719-991-33	s	DIODE 1SS133T-77
D2047	8-719-991-33	s	DIODE 1SS133T-77
D2111	8-719-110-41	s	DIODE RD15ES-B2
D2201	8-719-991-33	s	DIODE 1SS133T-77
IC101	1-804-664-11	s	IC LA71582M-MPB
IC111	8-759-433-44	s	IC MM1031XML
IC121	1-804-822-11	s	IC LC74781-9832
IC131	1-804-147-11	s	IC TL8825P
IC132	1-804-181-11	s	IC BA7611AN
IC211	1-801-984-11	s	IC LA6458D

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Ref. No. or Q'ty	Part No.	SP	Description
JK101	1-251-892-11	s	SOCKET, BNC,
JK102	1-251-892-11	s	SOCKET, BNC,
JK201	1-794-475-11	s	RCA-2, JACK
JK202	1-784-069-11	s	JACK, HOON D3.6
L1001	1-410-519-11	s	MICRO INDUCTOR 68UH
L1002	1-410-518-41	s	MICRO INDUCTOR 56UH
L1005	1-410-521-11	s	MICRO INDUCTOR 100UH
L1103	1-410-520-11	s	MICRO INDUCTOR 82UH
L1111	1-410-518-41	s	MICRO INDUCTOR 56UH
L1121	1-410-518-41	s	MICRO INDUCTOR 56UH
L1122	1-410-516-11	s	MICRO INDUCTOR 39UH
L1221	1-410-515-11	s	MICRO INDUCTOR 33UH
L1230	1-414-142-11	s	MICRO INDUCTOR 1 UH
L1231	1-410-518-41	s	MICRO INDUCTOR 56UH
L1253	1-410-518-41	s	MICRO INDUCTOR 56UH
L1301	1-414-142-11	s	MICRO INDUCTOR 1 UH
L1303	1-410-517-11	s	MICRO INDUCTOR 47UH
L1304	1-410-516-11	s	MICRO INDUCTOR 39UH
L1305	1-410-516-11	s	MICRO INDUCTOR 39UH
L1311	1-414-142-11	s	MICRO INDUCTOR 1 UH
L1321	1-410-516-11	s	MICRO INDUCTOR 39UH
L2071	1-410-521-11	s	MICRO INDUCTOR 100UH
Q1001	8-729-101-25	s	TRANSISTOR 2SC1009A
Q1003	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1004	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1005	8-729-101-25	s	TRANSISTOR 2SC1009A
Q1081	8-729-101-25	s	TRANSISTOR 2SC1009A
Q1088	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1089	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q1102	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1103	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q1104	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q1111	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1112	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1121	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1122	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1123	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1124	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1131	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1201	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1202	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1203	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q1205	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1210	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1211	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1212	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1213	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1214	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1241	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1242	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1243	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1251	8-729-205-97	s	TRANSISTOR 2SC3668-Y
Q1252	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1253	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1301	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1302	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1303	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1311	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R

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Ref. No. or Q'ty	Part No.	SP	Description
Q1321	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1322	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1323	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1324	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1337	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q1338	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1341	8-729-026-49	s	TRANSISTOR 2SA1037AK-T146-R
Q1342	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1343	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1344	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1601	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q1801	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q1851	8-729-901-81	s	TRANSISTOR 2SC2412K-T-146-R
Q2040	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q2041	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q2043	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q2045	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q2046	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q2047	8-729-920-31	s	TRANSISTOR DTC343TK
Q2048	8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
Q2071	1-810-880-11	s	TRANSISTOR 2SA1318-S
Q2072	8-729-873-40	s	TRANSISTOR 2SD734E
Q2073	1-810-471-11	s	TRANSISTOR 2SC3331-S-AA
Q2074	1-810-471-11	s	TRANSISTOR 2SC3331-S-AA
Q2075	1-810-880-11	s	TRANSISTOR 2SA1318-S
Q2204	8-729-027-56	s	TRANSISTOR DTC143TKA-T146
R1002	1-216-835-11	s	RESISTOR,CHIP 15K 1/16W
R1003	1-218-867-11	s	RESISTOR,CHIP 6.8K 1/10W(1608)
R1004	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R1005	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R1006	1-243-846-11	s	RESISTOR,CHIP 1.2K
R1007	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R1008	1-216-809-11	s	RESISTOR,CHIP 100 1/16W 1608
R1009	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1010	1-243-819-11	s	RESISTOR,CHIP 680
R1012	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R1013	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R1014	1-216-823-11	s	RESISTOR, CHIP 1.5K 1/16W
R1015	1-243-818-11	s	RESISTOR,CHIP 5.6K 16W
R1017	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1018	1-216-828-11	s	RESISTOR, CHIP 3.9K 1/16W 1608
R1019	1-218-850-11	s	RESISTOR,CHIP 1.3K 1/10W(1608)
R1020	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R1021	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1022	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R1024	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1026	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R1045	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1051	1-216-836-11	s	RESISTOR, CHIP 18K 1/16W 1608
R1062	1-216-857-11	s	RESISTOR,CHIP 1M 1/16W(1608)
R1081	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1082	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R1083	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1084	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1085	1-216-843-11	s	RESISTOR,CHIP 68K 1/16W (1608)
R1086	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R1088	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1103	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)

(VA-A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R1104	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R1111	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1112	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1113	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1114	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1116	1-216-817-11	s	RESISTOR,CHIP 470 1/16W 1608
R1117	1-216-817-11	s	RESISTOR,CHIP 470 1/16W 1608
R1118	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1120	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R1121	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R1122	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R1123	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R1124	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R1125	1-243-814-11	s	RESISTOR,CHIP 16W
R1126	1-218-867-11	s	RESISTOR,CHIP 6.8K 1/10W(1608)
R1127	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R1128	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R1129	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1131	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1201	1-218-285-11	s	RESISTOR,CHIP 75 1/16W (1608)
R1202	1-249-414-11	s	RESISTOR,CARBON 560 1/4W SMALL
R1203	1-249-414-11	s	RESISTOR,CARBON 560 1/4W SMALL
R1204	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R1205	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1209	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R1210	1-216-843-11	s	RESISTOR,CHIP 68K 1/16W (1608)
R1211	1-218-285-11	s	RESISTOR,CHIP 75 1/16W (1608)
R1212	1-245-301-11	s	RESISTOR,CHIP 56K
R1213	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R1214	1-243-819-11	s	RESISTOR,CHIP 680
R1215	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1216	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R1217	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1218	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R1219	1-216-049-11	s	RESISTOR, CHIP 1K 1/10W(2012)
R1220	1-216-049-11	s	RESISTOR, CHIP 1K 1/10W(2012)
R1221	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1222	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1223	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1231	1-216-813-11	s	RESISTOR, CHIP 220 1/16W 1608
R1232	1-245-300-11	s	RESISTOR, CHIP 820K
R1241	1-216-827-11	s	RESISTOR, CHIP 3.3K 1/16W 1608
R1242	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1243	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R1244	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1245	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1246	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1251	1-249-415-11	s	RES,CARBON 680 1/4W (SMALL)
R1252	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1253	1-216-813-11	s	RESISTOR, CHIP 220 1/16W 1608
R1254	1-216-849-11	s	RESISTOR,CHIP 220K 1/16W 1608
R1255	1-216-817-11	s	RESISTOR,CHIP 470 1/16W 1608
R1256	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R1257	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R1258	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1300	1-216-823-11	s	RESISTOR, CHIP 1.5K 1/16W
R1301	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1302	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R1303	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)

(VA-A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R1304	1-216-817-11	s	RESISTOR,CHIP 470 1/16W 1608
R1305	1-243-819-11	s	RESISTOR,CHIP 680
R1306	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1307	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1311	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1312	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1313	1-216-820-11	s	RESISTOR, CHIP 820 1/16W 1608
R1315	1-216-295-00	s	CONDUCTOR, CHIP (2012)
R1321	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1322	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R1323	1-216-843-11	s	RESISTOR,CHIP 68K 1/16W (1608)
R1324	1-245-301-11	s	RESISTOR,CHIP 56K
R1325	1-249-409-11	s	RESISTOR,CARBON 220 1/4W SMALL
R1326	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R1327	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R1328	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1329	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R1330	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R1331	1-216-049-11	s	RESISTOR, CHIP 1K 1/10W(2012)
R1332	1-245-303-11	s	RESISTOR, CHIP 2.2M
R1333	1-245-303-11	s	RESISTOR, CHIP 2.2M
R1334	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1336	1-245-303-11	s	RESISTOR, CHIP 2.2M
R1337	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1338	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1339	1-243-814-11	s	RESISTOR,CHIP 16W
R1340	1-216-838-11	s	RESISTOR CHIP 27K 1/16W(1608)
R1341	1-216-809-11	s	RESISTOR,CHIP 100 1/16W 1608
R1342	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R1343	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R1344	1-243-846-11	s	RESISTOR,CHIP 1.2K
R1345	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R1346	1-243-819-11	s	RESISTOR,CHIP 680
R1347	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R1348	1-218-701-11	s	RESISTOR,CHIP 2.4K 1/16W(1608)
R1349	1-243-814-11	s	RESISTOR,CHIP 16W
R1350	1-218-867-11	s	RESISTOR,CHIP 6.8K 1/10W(1608)
R1351	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1604	1-216-864-11	s	CONDUCTOR, CHIP (1608)
R1802	1-216-828-11	s	RESISTOR, CHIP 3.9K 1/16W 1608
R1804	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R1851	1-245-319-11	s	RESISTOR,CHIP 180
R1852	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R1853	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R1854	1-245-319-11	s	RESISTOR,CHIP 180
R1856	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R2001	1-218-850-11	s	RESISTOR,CHIP 1.3K 1/10W(1608)
R2002	1-216-838-11	s	RESISTOR CHIP 27K 1/16W(1608)
R2003	1-216-851-11	s	RESISTOR,CHIP 330K 1/16W 1608
R2004	1-216-813-11	s	RESISTOR, CHIP 220 1/16W 1608
R2005	1-243-814-11	s	RESISTOR,CHIP 16W
R2006	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R2007	1-243-814-11	s	RESISTOR,CHIP 16W
R2010	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R2011	1-216-829-11	s	RESISTOR,CHIP 4.7K 1/16W(1608)
R2012	1-216-828-11	s	RESISTOR, CHIP 3.9K 1/16W 1608
R2013	1-245-328-11	s	RESISTOR,CHIP 180
R2014	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R2015	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608

(VA-A BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R2040	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R2043	1-243-846-11	s	RESISTOR,CHIP 1.2K
R2045	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R2046	1-218-867-11	s	RESISTOR,CHIP 6.8K 1/10W(1608)
R2048	1-216-827-11	s	RESISTOR, CHIP 3.3K 1/16W 1608
R2071	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R2072	1-249-381-11	s	RES,CARBON 1 (1/4W)
R2073	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16W(1608)
R2074	1-249-401-11	s	RES,CARBON 47 1/4W (SMALL)
R2075	1-216-818-11	s	RESISTOR, CHIP 560 1/16W 1608
R2076	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R2077	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R2078	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R2079	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R2112	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R2113	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R2114	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R2115	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R2116	1-216-809-11	s	RESISTOR,CHIP 100 1/16W 1608
R2117	1-216-840-11	s	RESISTOR,CHIP 39K 1/16W 1608
R2119	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R2201	1-216-814-11	s	RESISTOR,CHIP 270 1/16W 1608
R2202	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R2203	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R2204	1-245-318-11	s	RESISTOR,CHIP 120K
RY101	1-755-468-11	s	RELAY
T2001	1-431-150-11	s	TRANSFORMER, OSC 70KHZ
TH131	1-801-345-11	s	THERMISTOR XAC102L400N
VR111	1-228-990-00	s	RESISTOR,ADJ METAL 1K
VR131	1-228-991-00	s	RESISTOR,ADJ 2.2K
X1001	1-760-597-11	s	OSCILLATOR,CRYSTAL(3.579545MHZ
X1201	1-579-346-11	s	CRYSTAL, OSC(7.16MHZ)
XF131	1-233-292-11	s	FILTER, LOW PASS 6MHZ (3028P)

CT-1 BOARD FOR SVT-RS100

Ref. No. or Q'ty	Part No.	SP	Description
C0001	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C0002	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C0003	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C0004	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C0005	1-124-589-11	s	CAPACITOR,ELECT 47MF/16V
C0006	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0007	1-137-643-11	s	CAPACITOR,ELECT 10MF 16V
C0008	1-165-931-11	s	CAPACITOR,CERAMIC 0.01MF 50V
C0010	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0011	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0014	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0018	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0019	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0020	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0021	1-164-156-11	s	CAPACITOR,CERAMIC 0.1MF/25V F
C0022	1-124-589-11	s	CAPACITOR,ELECT 47MF/16V
D0001	8-719-991-33	s	DIODE 1SS133T-77
D0002	8-719-991-33	s	DIODE 1SS133T-77
D0003	8-719-991-33	s	DIODE 1SS133T-77
D0004	8-719-991-33	s	DIODE 1SS133T-77
D0005	8-719-991-33	s	DIODE 1SS133T-77
F0001	1-233-590-11	s	FILTER DSS306-91B101M
F0002	1-233-590-11	s	FILTER DSS306-91B101M
F0003	1-233-590-11	s	FILTER DSS306-91B101M
IC001	8-759-252-59	s	IC MAX202CSE
IC002	1-804-793-11	s	IC UPD78F0034AGK-P013BA
IC003	1-801-356-11	s	IC MN1381-R
IC004	8-759-140-53	s	IC UPD4053BC
IC005	1-803-882-11	s	IC MAX3082CSA
JK002	1-816-618-11	s	JACK-MODULAR 4
JK003	1-816-618-11	s	JACK-MODULAR 4
L0001	1-414-540-11	s	INDUCTOR 1.1UH
R0001	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0002	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0003	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0004	1-216-820-11	s	RESISTOR, CHIP 820 1/16W 1608
R0005	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0006	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0007	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0008	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0009	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0010	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0011	1-249-406-11	s	RES,CARBON 120 1/4W SMALL
R0012	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W (1608)
R0013	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R0014	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R0015	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R0016	1-216-864-11	s	CONDUCTOR, CHIP (1608)
R0017	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R0018	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
R0026	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W(1608)
S0001	1-786-373-11	s	SOLID, SWITCH 1P-2T
X0001	1-795-624-11	s	CERAMIC, OSC 8.38MHZ

MC-1 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8321-980-A	o	MOUNTED CIRCUIT BOARD, MC-1
C8001	1-164-159-21	s	CAPACITOR,CERAMIC 0.1MF(S-)
R8003	1-249-410-11	s	RES,CARBON 270 1/4W (SMALL)
R8004	1-249-407-11	s	RES,CARBON 150 1/4W (SMALL)
R8005	1-249-410-11	s	RES,CARBON 270 1/4W (SMALL)
S8002	1-762-173-11	s	SWITCH, EP (1P-1T)

PW-1 BOARD

Ref. No. or Q'ty		Part No.	SP	Description
1pc		A-8344-343-A	s	MOUNTED CIRCUIT BOARD, PW-1
C5001	⚠	1-127-769-11	s	CAPACITOR,FILM 0.033MF
C5002	⚠	1-127-769-11	s	CAPACITOR,FILM 0.033MF
C5005	⚠	1-135-582-11	s	CAPACITOR CERAMIC 1000PF
C5007	⚠	1-127-771-11	s	CAPACITOR,CERAMIC 2200PF
C5011		1-124-257-00	s	CAPACITOR,ELECT 2.2MF/50V
C5014		1-130-495-11	s	CAPACITOR,FILM 0.1MF/50V
C5017		1-115-701-11	s	CAPCITOR, ELECT, 680PF/1KV
C5019		1-102-976-00	s	CAPACITOR,CERAMIC 180PF/50V SL
C5030		1-115-192-11	s	CAPACITOR,ELECT 150MF/200V
C5101		1-135-413-11	s	CAPACITOR,ELECT 1000MF 6.3V
C5102		1-135-413-11	s	CAPACITOR,ELECT 1000MF 6.3V
C5103		1-115-789-11	s	CAPACITOR ELECT 1000MF/25V 105
C5104		1-115-789-11	s	CAPACITOR ELECT 1000MF/25V 105
C5108		1-126-967-11	s	CAPACITOR,ELECT 47MF/50V
C5109		1-126-947-11	s	CAPACITOR, ELECT 47MF/35V
C5110		1-126-176-11	s	CAPACITOR,ELECT 220MF/10V
C5111		1-130-495-11	s	CAPACITOR,FILM 0.1MF/50V
C5119		1-124-589-11	s	CAPACITOR,ELECT 47MF/16V
C5124		1-109-952-11	s	CAPACITOR ERECT 0.47MF/50V(NP)
C5130		1-102-228-00	s	CAPACITOR,CERAMIC;470PF/500V
C5131		1-102-228-00	s	CAPACITOR,CERAMIC;470PF/500V
CN501	⚠	1-251-828-11	s	SOCKET, AC INLET
D5001		1-803-466-11	s	DIODE DB154G-S
D5003		8-719-901-83	s	DIODE 1SS83
D5006		8-719-901-83	s	DIODE 1SS83
D5011		8-719-901-83	s	DIODE 1SS83
D5013	⚠	1-801-299-11	s	PHOTO COUPLER PS2501-1D
D5101		1-803-251-11	s	DIODE SF-24
D5104		1-803-251-11	s	DIODE SF-24
D5105		8-719-901-83	s	DIODE 1SS83
D5106		8-719-901-83	s	DIODE 1SS83
D5107		8-719-970-87	s	DIODE ERA38-06 (RECTI)
D5108		8-719-921-40	s	DIODE MTZJ4.7C
D5110		8-719-109-93	s	DIODE RD6.2ES-B2
F5001	⚠	1-532-743-11	s	FUSE,GLASS TUBE 2A/125V(20MM)
IC511		1-810-060-11	s	IC L5431-AA
IC513		1-810-060-11	s	IC L5431-AA
L5001	⚠	1-234-483-11	s	FILTER, LINE
L5010		1-414-540-11	s	INDUCTOR 1.1UH
L5101		1-410-509-11	s	MICRO INDUCTOR 10UH
L5102		1-410-509-11	s	MICRO INDUCTOR 10UH
PR511	⚠	1-533-611-11	s	PROTECTOR, IC 1.0A 50V
PR512	⚠	1-533-611-11	s	PROTECTOR, IC 1.0A 50V
Q5002		1-809-602-11	s	TRANSISTOR 2SC2274-F-AA
Q5003		8-729-140-97	s	TRANSISTOR 2SB734-34
Q5004		1-809-602-11	s	TRANSISTOR 2SC2274-F-AA
Q5010		1-801-298-11	s	TRANISTOR 2SK2434
Q5140		8-729-024-68	s	TRANSISTOR 2SD1801-S
Q5141		8-729-029-56	s	TRANSISTOR DTA144ESA
Q5142		8-729-027-59	s	TRANSISTOR DTC144EKA (T146)
R5001	⚠	1-240-219-11	s	RESISTOR ,SOLID 2.7M
R5002		1-247-887-00	s	RESISTOR,CARBON 220K 1/4W
R5003		1-247-887-00	s	RESISTOR,CARBON 220K 1/4W

(PW-1 BOARD)

Ref. No. or Q'ty		Part No.	SP	Description
R5010		1-216-073-00	s	RESISTOR,CHIP 10K 1/10W(2012)
R5011		1-216-001-00	s	RESISTOR, CHIP 10 1/10W(2012)
R5012		1-216-109-00	s	RESISTOR CHIP 330K 1/10W(2012)
R5013		1-216-059-00	s	RESISTOR,CHIP 2.7K 1/10W(2012)
R5014		1-216-095-00	s	RESISTOR, CHIP 82K 1/10W(2012)
R5015		1-216-081-00	s	RESISTOR,CHIP 22K 1/10W(2012)
R5016		1-216-101-00	s	RESISTOR CHIP 150K 1/10W(2012)
R5020		1-240-308-11	s	RESISTOR,CHIP 100 1W
R5021		1-240-308-11	s	RESISTOR,CHIP 100 1W
R5101		1-216-037-00	s	RESISTOR,CHIP 330 1/10W(2012)
R5102		1-245-417-11	s	RESISTOR,CHIP 180 1/10W(2012)
R5103		1-245-418-11	s	RESISTOR, CHIP 560 1/10W(2012)
R5104		1-249-427-11	s	RES,CARBON 6.8K 1/4W (SMALL)
R5111		1-245-418-11	s	RESISTOR, CHIP 560 1/10W(2012)
R5114		1-216-037-00	s	RESISTOR,CHIP 330 1/10W(2012)
R5122		1-249-391-11	s	RES,CARBON 6.8 1/4W
R5123		1-216-055-00	s	RESISTOR CHIP 1.8K 1/10W(2012)
R5140		1-249-419-11	s	RESISTOR,CARBON 1.5K 1/4W
R5141		1-249-419-11	s	RESISTOR,CARBON 1.5K 1/4W
R5142		1-245-394-11	s	RESISTOR,CHIP 8.2K 1/10W(2012)
R5143		1-243-935-11	s	RESISTOR CHIP 2.2K 1/10W(2012)
R5144		1-216-295-00	s	CONDUCTOR, CHIP (2012)
R5145		1-249-410-11	s	RES,CARBON 270 1/4W (SMALL)
R5146		1-249-410-11	s	RES,CARBON 270 1/4W (SMALL)
R5147		1-249-410-11	s	RES,CARBON 270 1/4W (SMALL)
R5150		1-216-646-11	s	RESISTOR,CHIP 620 1/10W (2012)
T5001	⚠	1-433-643-11	s	TRANSFORMER, POWER
VA501	⚠	1-801-123-11	s	VARISTOR ENC4710D-05AS6
Y5074		1-533-583-11	s	FUSE,HOLDER
Y5075		1-533-583-11	s	FUSE,HOLDER
Y5076		3-968-578-01	o	HOLDER
Y5077		3-968-578-01	o	HOLDER
Y5078		3-968-578-01	o	HOLDER
Y5092		7-682-161-09	s	SCREW +P4X8
Y5093		7-682-161-09	s	SCREW +P4X8
Y5094		7-688-004-01	s	WASHER W4 SMALL
Y5095		7-688-004-01	s	WASHER W4 SMALL

TM-1 BOARD
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*A: [SVT-RA40]
*B: [SVT-RA168]

Ref. No. or Q'ty		Part No.	SP	Description
1pc	*B	A-8344-347-A	s	MOUNTED CIRCUIT BOARD, TM-1
1pc	*A	A-8344-473-A	s	MOUNTED CIRCUIT BOARD, TM-1
1pc		1-518-833-11	s	INDICATOR TUBE
C7103		1-124-589-11	s	CAPACITOR,ELECT 47MF/16V
C7104		1-102-129-00	s	CAPACITOR,CERAMIC;50V/0.01MF
C7105		1-164-159-21	s	CAPACITOR,CERAMIC 0.1MF(S-)
C7108		1-102-973-00	s	CAPACITOR,CERAMIC 100PF/50V
C7110		1-162-291-31	s	CAPACITOR,CERAMIC 560PF/50V(B)
C7111		1-162-291-31	s	CAPACITOR,CERAMIC 560PF/50V(B)
C7112		1-162-291-31	s	CAPACITOR,CERAMIC 560PF/50V(B)
C7113		1-162-291-31	s	CAPACITOR,CERAMIC 560PF/50V(B)
D7101		8-719-078-45	s	DIODE GMA01U-BT
D7102		8-719-078-45	s	DIODE GMA01U-BT
D7103		8-719-078-45	s	DIODE GMA01U-BT
D7106		8-719-078-45	s	DIODE GMA01U-BT
D7109		8-719-078-45	s	DIODE GMA01U-BT
D7112		8-719-078-45	s	DIODE GMA01U-BT
D7114		8-719-078-45	s	DIODE GMA01U-BT
D7115		8-719-078-45	s	DIODE GMA01U-BT
D7116		8-719-078-45	s	DIODE GMA01U-BT
D7117		8-719-078-45	s	DIODE GMA01U-BT
D7130		8-719-901-83	s	DIODE 1SS83
D7136		8-719-078-45	s	DIODE GMA01U-BT
D7139	*A	8-719-078-45	s	DIODE GMA01U-BT
D7143	*B	8-719-078-45	s	DIODE GMA01U-BT
D7145		8-719-078-45	s	DIODE GMA01U-BT
D7150		8-719-301-58	s	LED SEL2910D-D
D7151		1-801-879-11	s	LED SEL2410GM
D7152		8-719-301-58	s	LED SEL2910D-D
IC711		1-804-662-11	s	IC MN12510F
L7101		1-400-206-11	s	INDUCTOR 10MF
Q7130		8-729-900-45	s	TRANSISTOR DTC114EF
Q7132		8-729-900-45	s	TRANSISTOR DTC114EF
R7102		1-249-414-11	s	RESISTOR,CARBON 560 1/4W SMALL
R7103		1-249-414-11	s	RESISTOR,CARBON 560 1/4W SMALL
R7104		1-249-414-11	s	RESISTOR,CARBON 560 1/4W SMALL
R7105		1-249-414-11	s	RESISTOR,CARBON 560 1/4W SMALL
R7106		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7107		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7108		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7109		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7114		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7115		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7116		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7117		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7118		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7120		1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R7121		1-249-425-11	s	RESISTOR,CARBON 4.7K 1/4W
R7122		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7123		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7124		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7125		1-249-439-11	s	RESISTOR,CARBON 68K 1/4W SMALL
R7130		1-249-408-11	s	RES,CARBON 180 1/4W (SMALL)

(TM-1 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R7131	1-249-407-11	s	RES,CARBON 150 1/4W (SMALL)
R7132	1-249-408-11	s	RES,CARBON 180 1/4W (SMALL)
R7139	1-249-417-11	s	RESISTOR,CARBON 1K 1/4W(SMALL)
S7102	1-762-802-11	s	SWITCH, SLIDE (2P-2T)
S7103	1-762-802-11	s	SWITCH, SLIDE (2P-2T)
S7104	1-762-802-11	s	SWITCH, SLIDE (2P-2T)
S7106	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7107	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7108	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7111	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7113	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7114	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7116	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7118	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7119	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7120	1-762-304-11	s	SWITCH, PUSH (1P-1T)
X7101	1-233-491-11	s	CERAMIC OSC 4.000MHZ
Y7101	3-946-542-01	o	HOLDER

TM-2 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8344-348-A	s	MOUNTED CIRCUIT BOARD, TM-2
S7201	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7202	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7203	1-762-303-11	s	SWITCH, PUSH (1P-1T)
S7204	1-762-303-11	s	SWITCH, PUSH (1P-1T)
S7205	1-762-303-11	s	SWITCH, PUSH (1P-1T)
S7206	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7207	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7208	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7209	1-762-304-11	s	SWITCH, PUSH (1P-1T)
S7210	1-762-303-11	s	SWITCH, PUSH (1P-1T)

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-801-326-11	s	PHOTO COUPLER SG-105F
1pc	1-810-690-11	s	LED LN59L
1pc	1-810-691-11	s	PHOTO DIODE PN263L-NC

PACKING MATERIALS & SUPPLIED ACCESSORIES FOR SVT-RA40/RA168
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*A: [SVT-RA40]
*B: [SVT-RA168]

Ref. No. or Q'ty	Part No.	SP	Description
1pc	⚠ 1-824-298-11	s	CORD, POWER
1pc	*B 3-206-574-01	s	MANUAL, INSTRUCTION
1pc	*A 3-206-678-01	s	MANUAL, INSTRUCTION

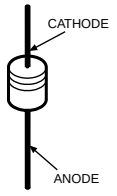
PACKING MATERIALS & SUPPLIED ACCESSORIES FOR SVT-RS100

Ref. No. or Q'ty	Part No.	SP	Description
1pc	3-206-934-01	s	MANUAL, INSTRUCTION
1pc	3-940-396-01	o	PLATE,SPRING
1pc	7-685-645-19	s	SCREW +BVTP3X6

Section 5
Semiconductors

DIODE

ERA38-04-V5
ERA38-06(RECTI)
HZS9.1NB2
MTZJ4.7C
MTZJ-T-77-15B
MTZJ-T-77-18B
MTZJ-T-77-4.7C
MTZJ-T-77-5.6C
MTZJ-T-77-6.2C
MTZJ-T-77-9.1B
RD15ES-B2
RD18ES-B2
RD5.6ES-B2
RD6.2ES-B2



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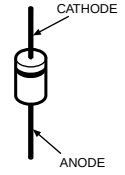

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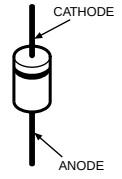
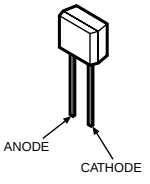


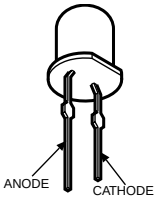
PN263L-NC



AK04V2
AK04-V2
DB154G-S
RB441Q-40T-77
SF-24

LED

SEL2910D-D
SEL2910D-TP2-D



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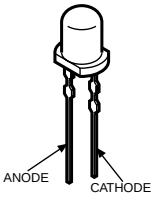

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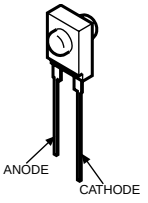

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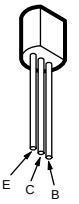
2SD734-E



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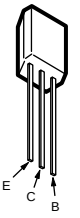

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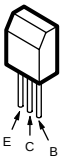

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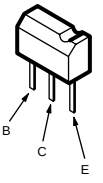

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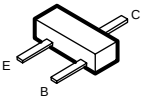

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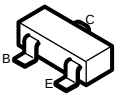
DTC143TK
DTC143TKA-T146
DTC343TK
DTC144EKA



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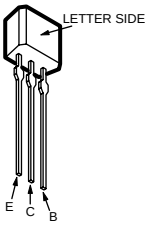

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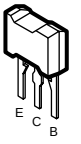

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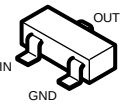

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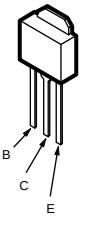

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2SK2434

IC, Other

IC

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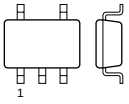
TC4S81F



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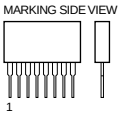

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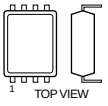

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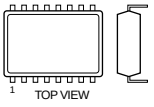

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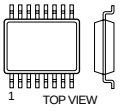
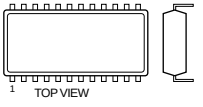


LA7116



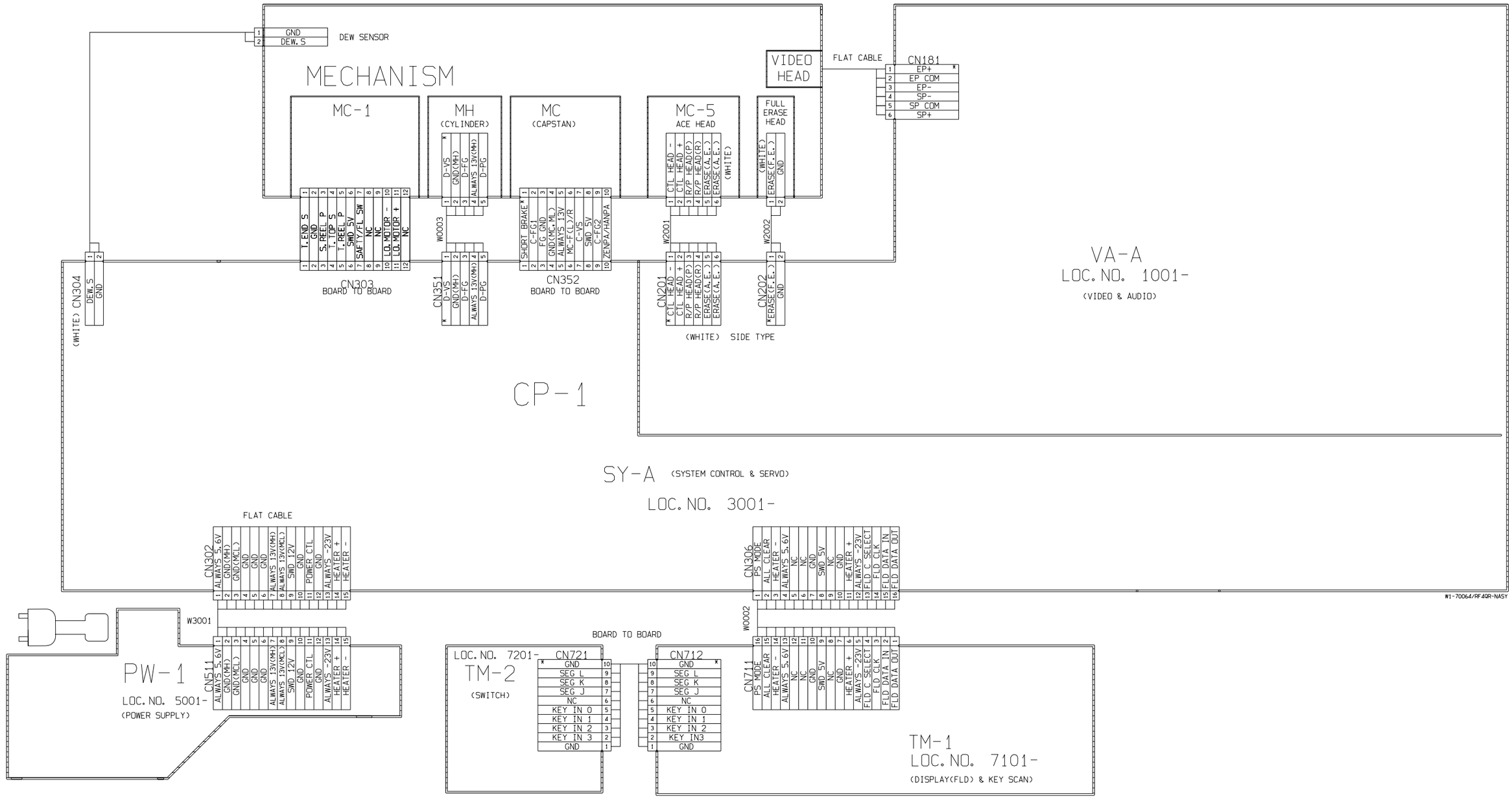
L5431-AA
LA71582M-MPB
LB1643L
LC74781-9832
MAX3082CSA
MM1031XML
MN12510F
MN1381-R
PST9128NR
TL8825P
UPD78F0034AGK-P013BA

OTHER

GPIS094HCZ
PS2501-1D
SG-105F

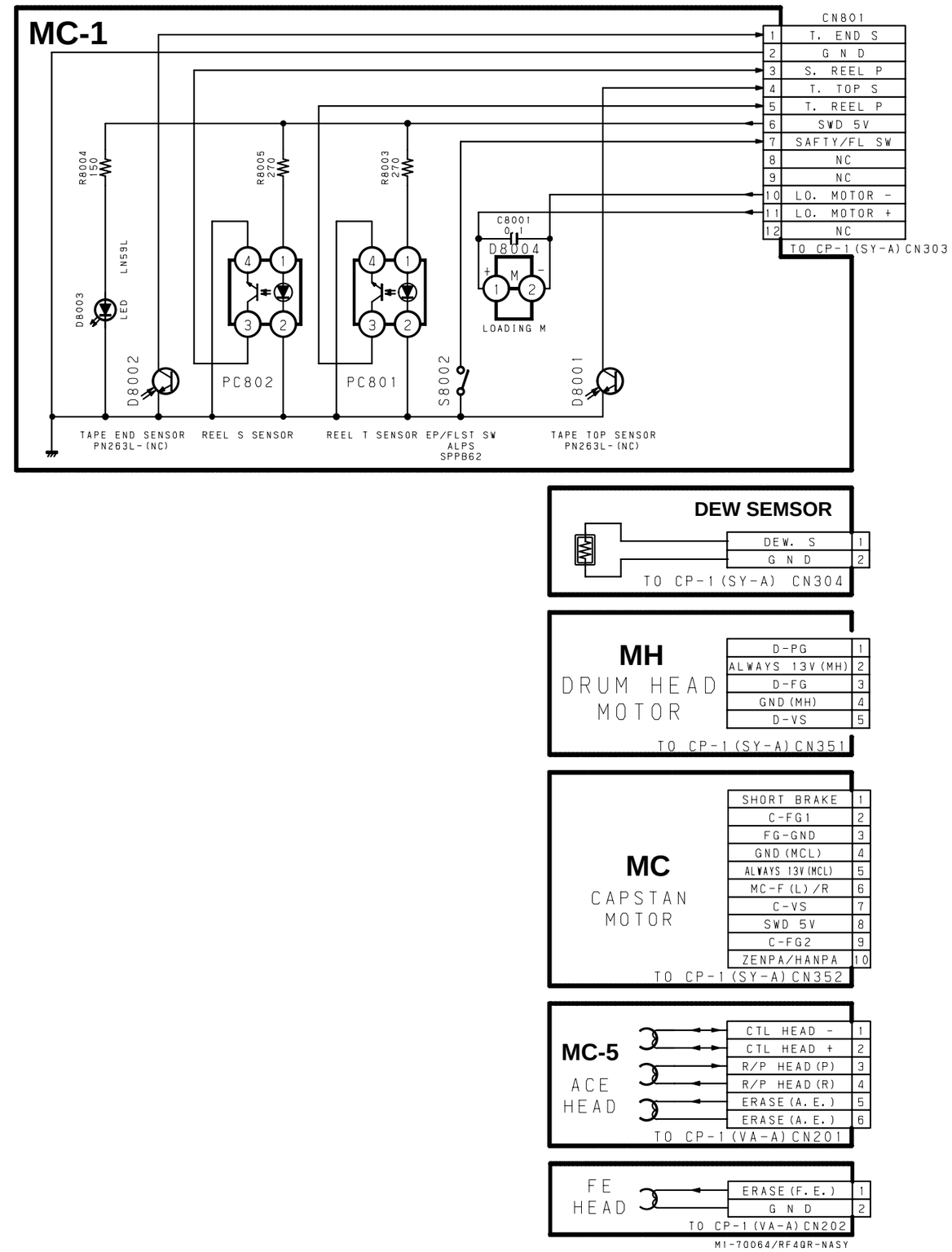
Section 6
Block Diagrams

Overall Wiring



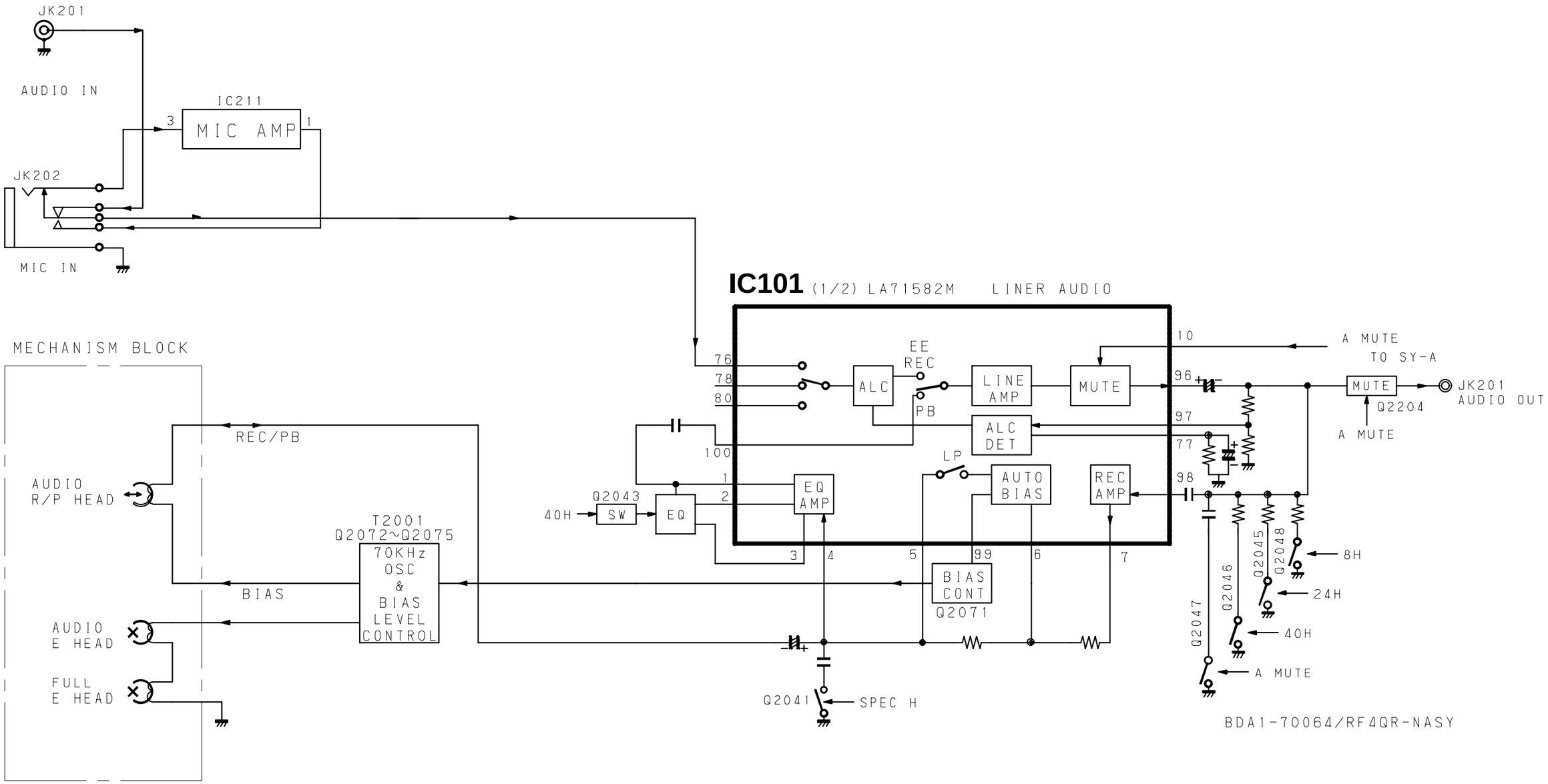
Mechanism Connection

Mechanism Connection

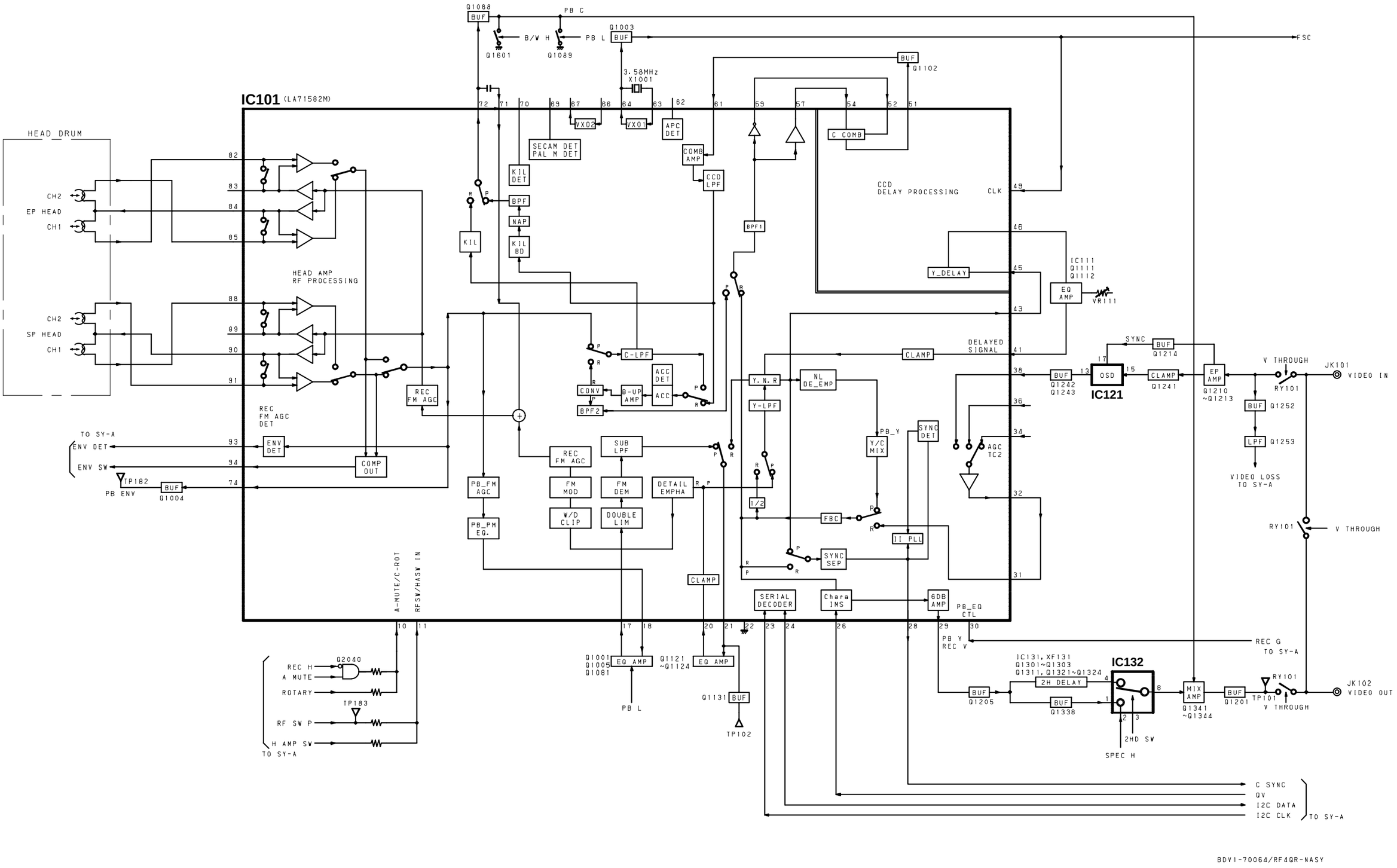


6-2

Audio Circuit

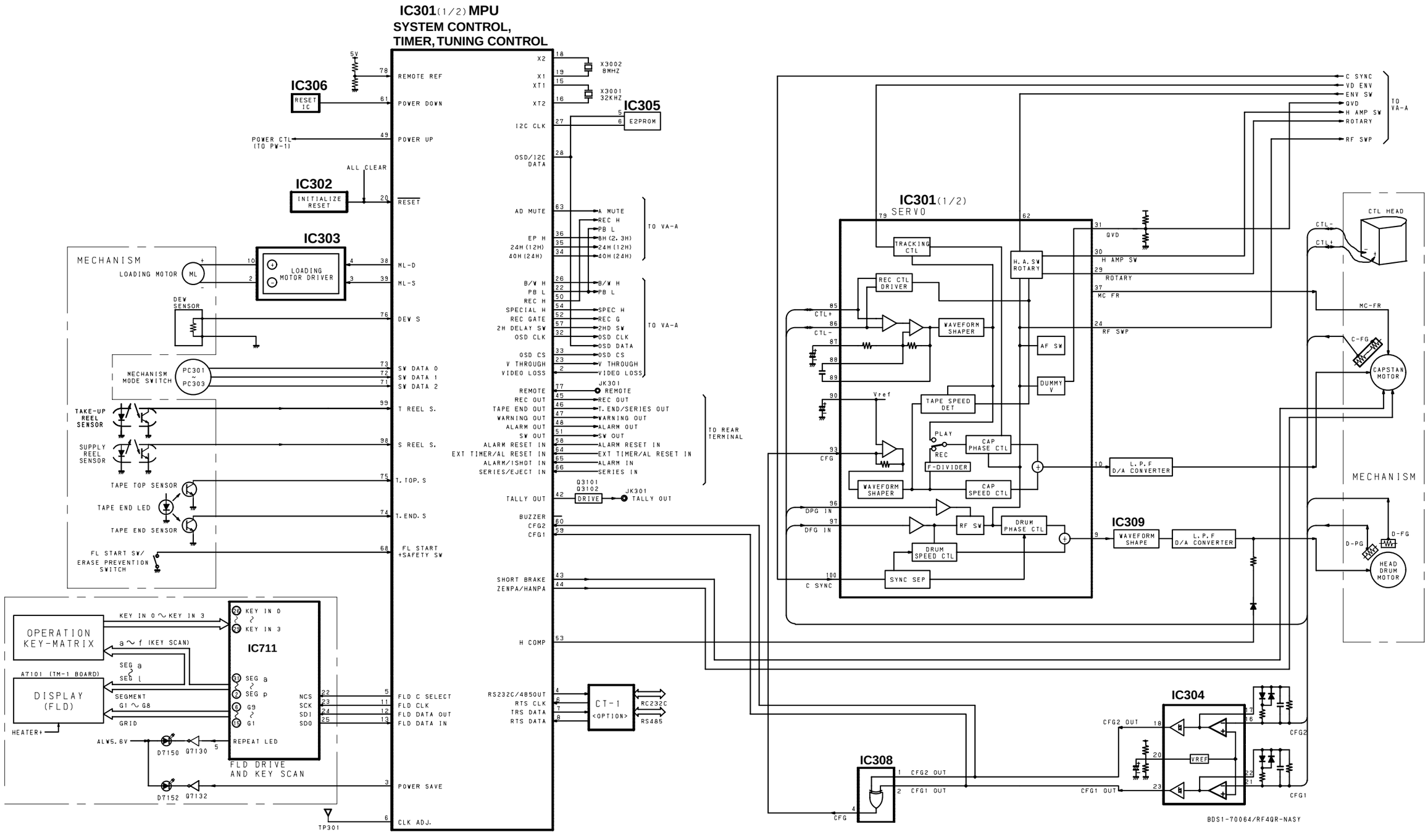


Video Circuit



System Control & Servo Circuit

System Control & Servo Circuit

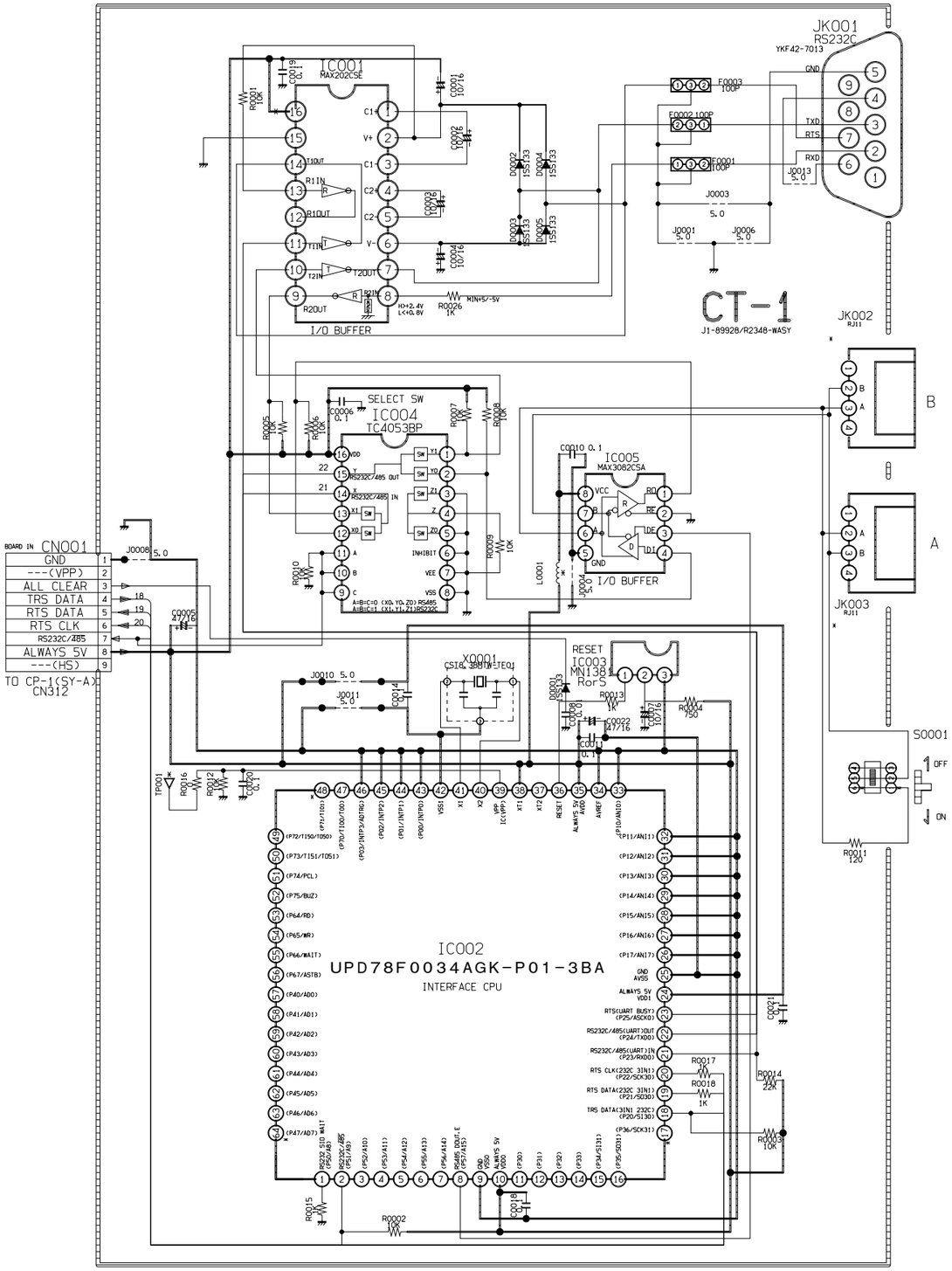


6-5

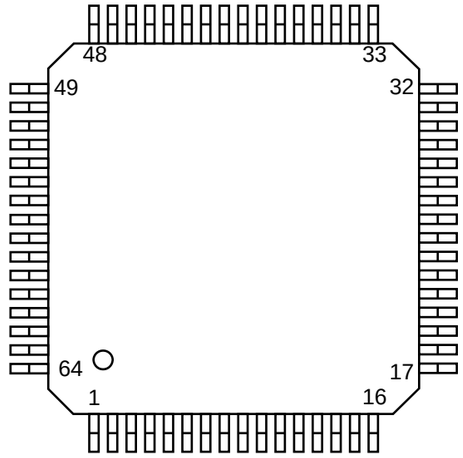
Section 7
Schematic Diagrams

CT-1 Board (Option Board for SVT-RS100)

Interface



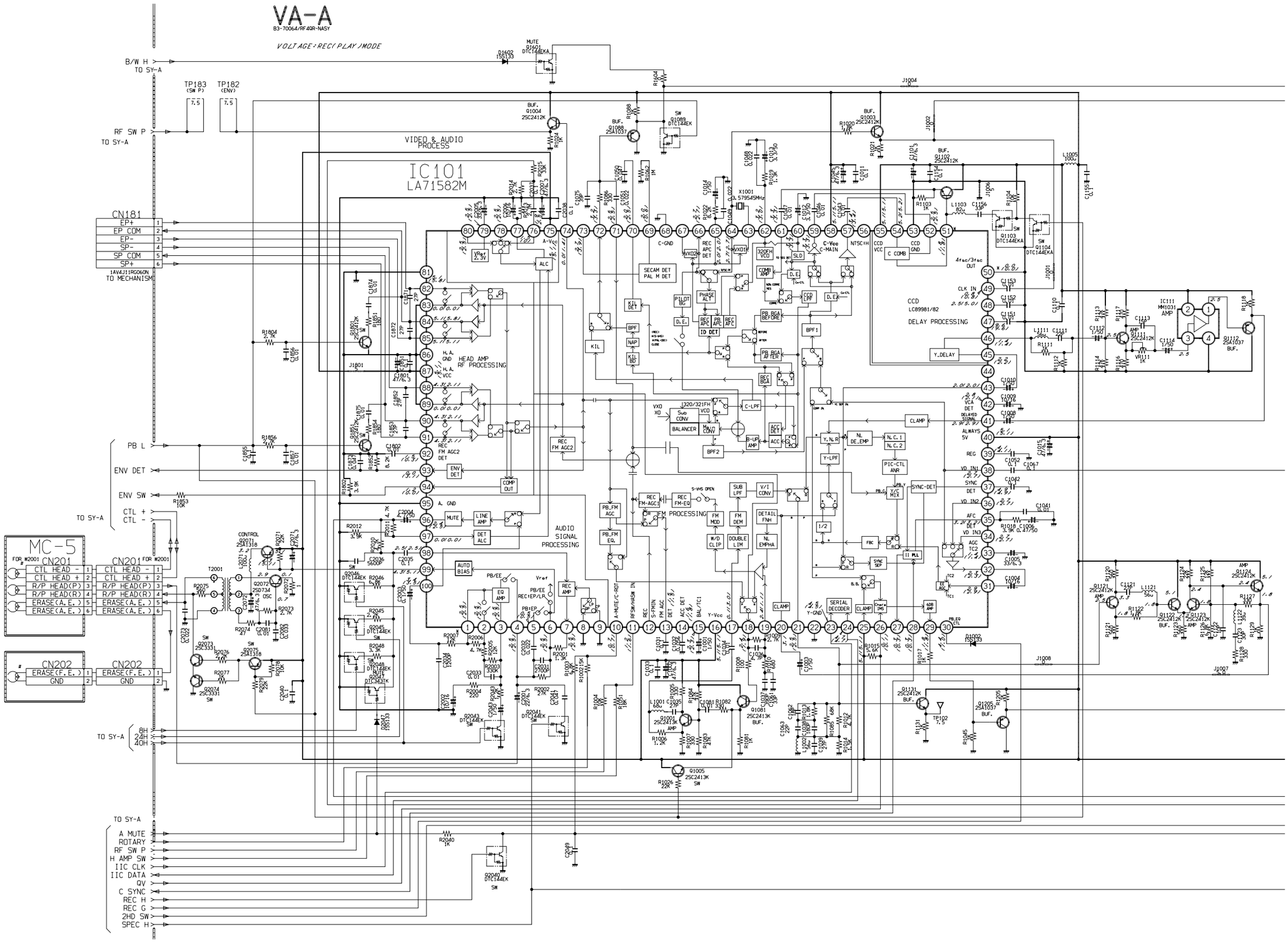
IC002 Interface MPU Pin Function Table

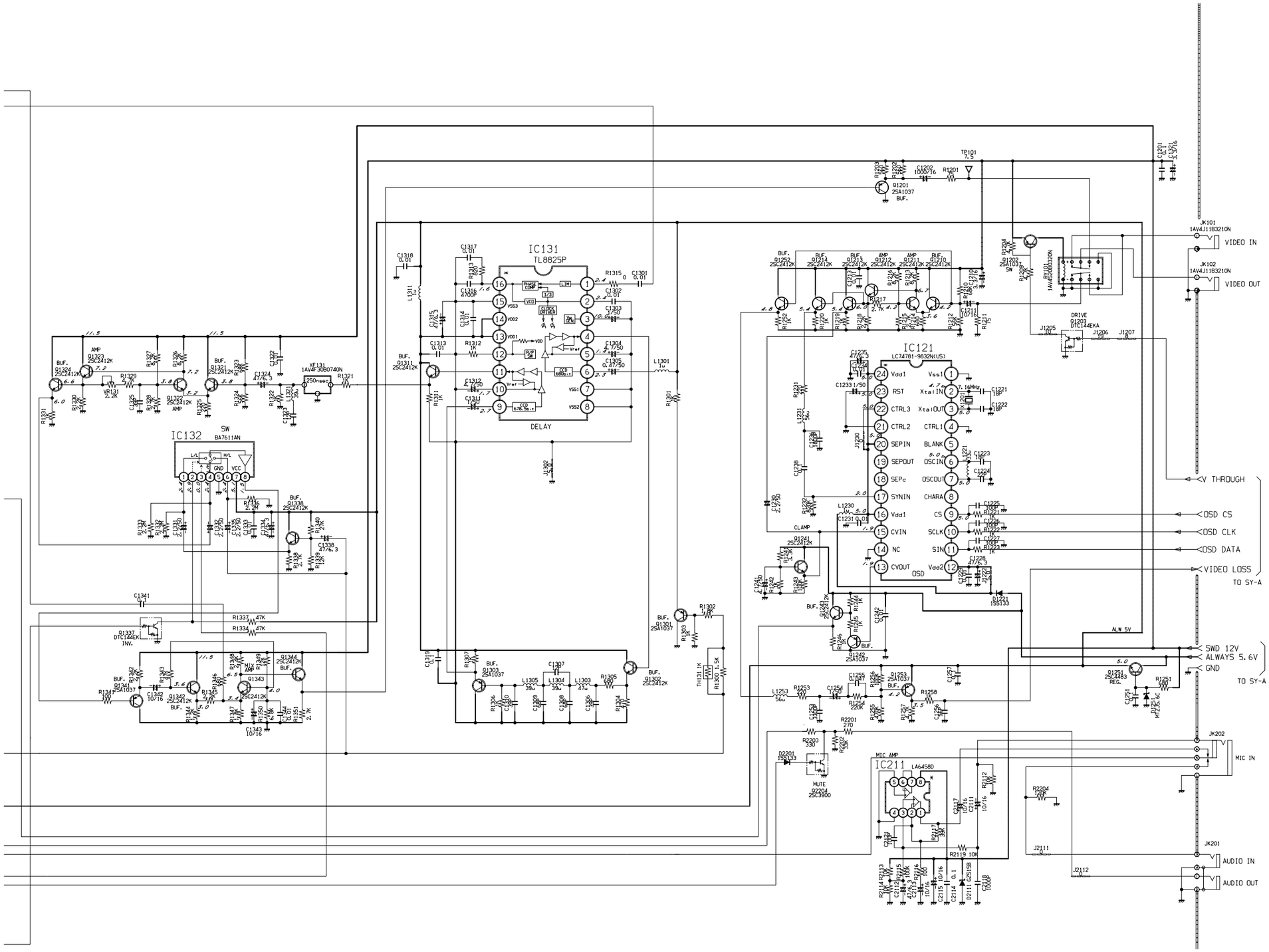


No.	Name	I/O	H/L	Signal Function
2	232C/485	I	-	Signal to use RS232C or RS485. (232C=low)
8	R485 OUT E.	O	-	Enable signal to RS485 data out.
9	GND	-	-	Ground terminal.
10	ALW 5V	-	-	Always 5V
18	TRS DATA	I	-	Data from system control IC. (Transferring signal data)
19	RTS DATA	O	-	Data to system control IC. (Return signal data)
20	RTS CLK	O	-	Clock signal to system control CPU.
21	RS232C/485 IN	I	-	Data from controller. (Through RS232C or RS485)
22	RS232C/485 OUT	O	-	Data to controller. (Through RS232C or RS485)
23	RST	O	-	Return signal to controller.
24	ALW 5V	-	-	Always 5V
25	GND	-	-	Ground terminal.
36	RESET	I	L	Initial reset terminal for this IC.
34	GND	-	-	Ground terminal.
35	ALW 5V	-	-	Always 5V
40 41	CF	-	-	IC clock OSC terminal. 8.38MHz

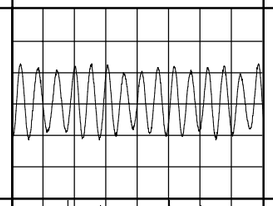
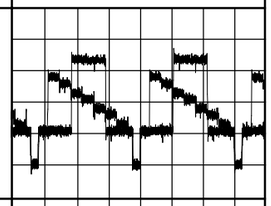
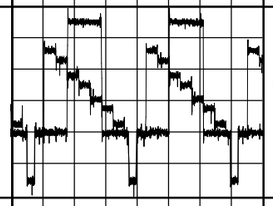
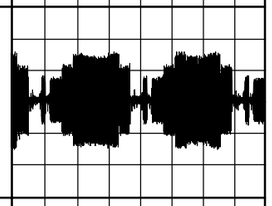
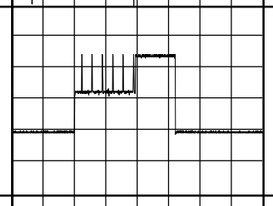
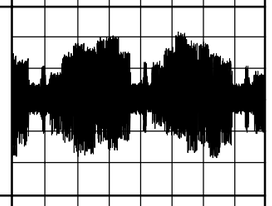
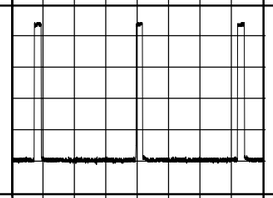
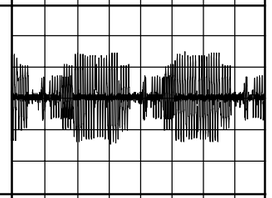
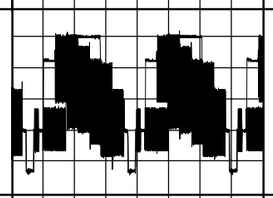
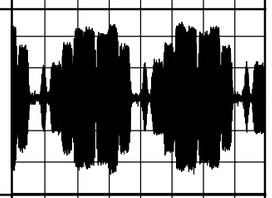
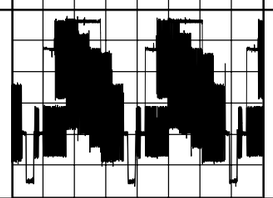
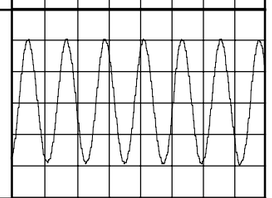
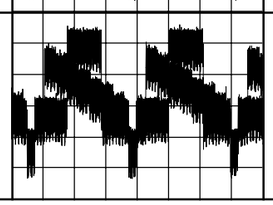
R2348WA_IC002

CP-1 Board (VA-A)
Video & Audio




IC131
TL8825P
DELAY
IC132
SW
BA7611AN
IC121
LC74781-9832N(US)
Vdd1
RST
CTRL3
CTRL2
SEPIN
SEPOUT
SEPc
SYNIN
Vdd1
CVIN
NC
CVOUT
Vss1
XtalIN
XtalOUT
CTRL1
BLANK
OSCIN
OSCOUT
CHARA
CS
SCLK
SIN
Vdd2
OSD
CLAMP
DRIVE
DTC144EKA
MIC AMP
IC211
LA6458D
MUTE
JK101
1AV4J11B3210N
VIDEO IN
JK102
1AV4J11B3210N
VIDEO OUT
V THROUGH
OSD CS
OSD CLK
OSD DATA
VIDEO LOSS
TO SY-A
SWD 12V
ALWAYS 5.6V
GND
TO SY-A
JK202
MIC IN
JK201
AUDIO IN
AUDIO OUT
ALW 5V
REG.

Video Circuit Waveforms

TEST POINT LOCATION	WAVEFORM	TEST POINT LOCATION	WAVEFORM
IC101 PIN17 PLAY 100mV/500ns/div		IC101 PIN43,45 REC/PLAY 100mV/20µs/div	
IC101 PIN20,21 REC/PLAY 100mV/20µs/div		IC101 PIN57,59 REC/PLAY 100mV/20µs/div	
IC101 PIN26 STILL 2V/200µs/div		IC101 PIN51,61 REC/PLAY 100mV/20µs/div	
IC101 PIN28 REC/PLAY 1V/20µs/div		IC101 PIN71,72 REC 100mV/20µs/div	
IC101 PIN29 REC/PLAY 500mV/20µs/div		IC101 PIN71,72 PLAY 100mV/20µs/div	
IC101 PIN34,36,38 REC 200mV/20µs/div		IC101 PIN90 REC 1V/200ns/div	
IC101 PIN41,46 REC/PLAY 100mV/20µs/div			

WF_V_SE4

IC301 System Control, Timer, OSC & Servo MPU Pin Function Table

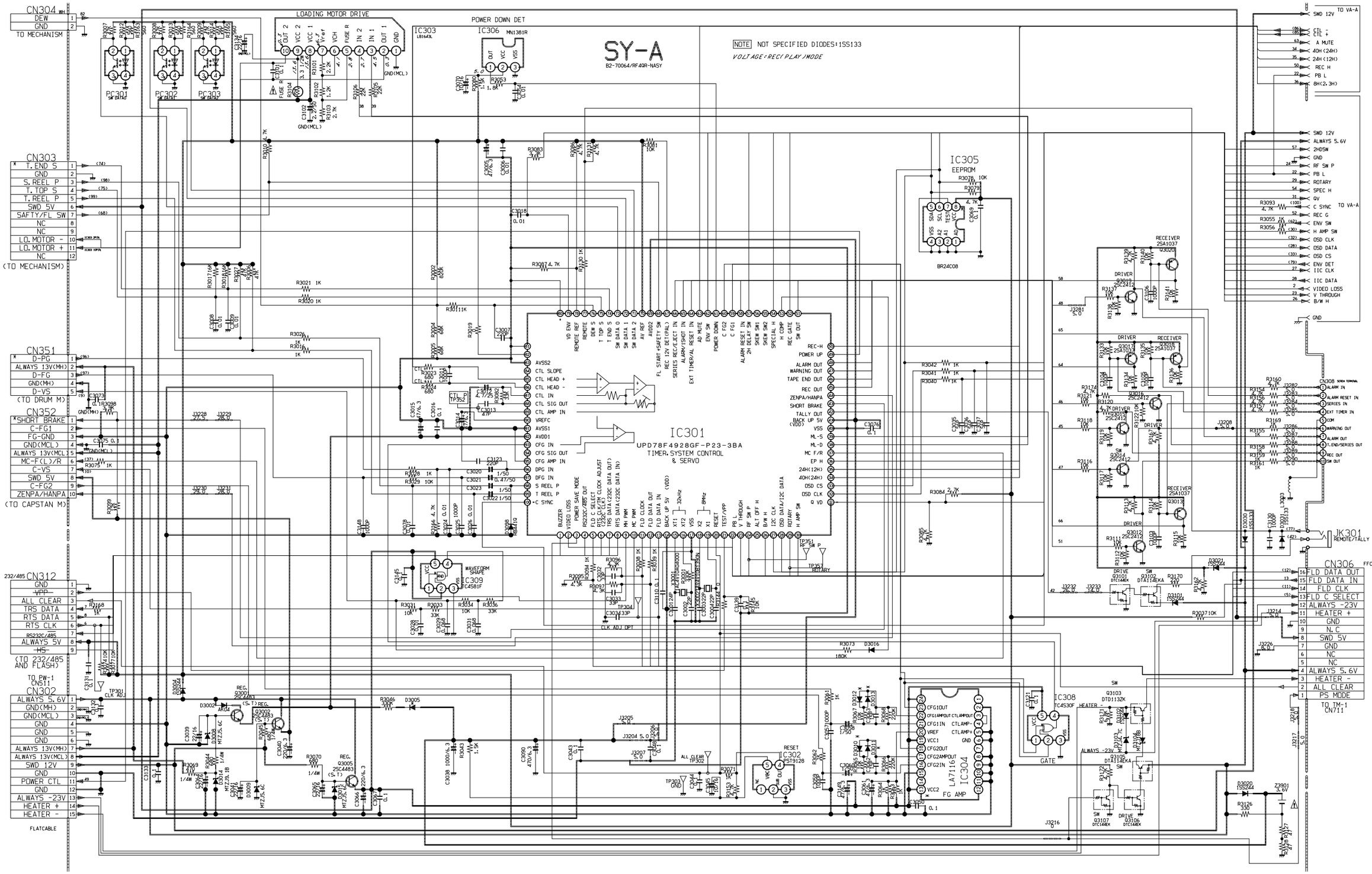
No.	Name	I/O	H/L	Signal Function
1	BUZZER	O	-	Buzzer drive signal.
2	VIDEO LOSS	I	-	To detect the loss of video signal.
3	POWER SAVE	O	H	Power save LED drive signal.
4	RS232C/485OUT	O	-	RS232C/485 select signal. 232C=H
5	FLD C SELECT	O	H	Chip enable signal to FLD control IC.
6	RTS CLK	I	-	Clock signal from controller CPU.
7	TRS DATA	O	-	Data signal to controller.
8	RTS DATA	I	-	Data signal from controller.
9	MH-PWM	O	-	Output of head drum motor servo control signal. (PWM signal)
10	MC-PWM	O	-	Output of capstan motor servo control signal. (PWM signal)
11	FLD CLK	O	-	Clock signal to FLD control IC.
12	FLD DATA OUT	O	-	Data signal to FLD control IC.
13	FLD DATA IN	O	H	High output except when power is off.
14	BACKUP 5V	O	-	5VDC
15	XT1	-	-	Clock osc during power failures and timer. 32.768KHz
16	XT2	-	-	
17	Vss	-	-	Ground terminal.
18	X2	-	-	System clock OSC. 8MHz
19	X1	-	-	
20	RESET	I	L	Initial reset terminal for this IC.
21	TEST/Vpp	-	-	-
22	PB L	O	L	Signal for indicating playback mode.
23	V THROUGH	O	H	Relay switch for video-through drive signal.
24	RF SW P	O	-	RF switching pulse created by head drum PG.
25	ALT OFF H	-	-	-
26	B/W H	O	H	'H' during monocrome image mode.
27	I2C CLK	O	-	Clock to EEPROM and Y/C IC.
28	OSD DATA /IIC DATA	O	H	Data I/O to OSD Y/C and EEPROM IC.
29	ROTARY	O	-	Video head CH1/CH2 confirmation signal. (Used in the processing of image circuit color signals.)
30	H AMP SW	O	-	Video head CH1/CH2 confirmation signal. (Used in the video head amp.)
31	QVD	O	-	Quasi vertical synchronizing signal.
32	OSD CLK	O	-	Clock to OSD IC.
33	OSD CS	O	H	Chip enable signal to on screen display IC.
34	40H(24H)	O	H	Signal for indicating 40H(24H) mode.
35	24H(12H)	O	H	Signal for indicating 24H(12H) mode.
36	8 H	O	H	Signal for indicating 8H mode.
37	MC F/R	O	-	Capstan motor rotation direction (normal/reverse) indication signal. (Reverse; H)
38	ML-D	O	-	Loading motor rotation direction indication signal. (Load; H, Brake; M, Unload; L)
39	ML-S	O	-	Loading motor speed (high/mid/low) indication signal.
40	VSS	-	-	Ground terminal.
41	BACKUP 5V	-	-	5VDC
42	TALLY OUT	O	-	Signal to indicate the warning or the current mode of VCR.
43	SHORT BRAKE	O	H	Brake signal for capstan motor.
44	ZENPA/HANPA	O	-	Capstan motor speed mode indicating.
45	REC OUT	O	H	Recording mode indicating signal output.
46	TAPE END OUT	O	H	Tape end control signal output.
47	WARNING OUT	O	H	Warning output.
48	ALARM OUT	O	H	Alarm mode indicating signal output.
49	POWER UP	O	H	"H" output except the power is off.
50	REC H	O	H	Signal for indicating recording mode.

No.	Name	I/O	H/L	Signal Function
51	SW OUT	O	-	Switch signal to multiplexer.
52	REC GATE	O	L	Signal to indicate recording.
53	H COMP	O	H	Pulse signal to adjust the speed of head drum.
54	SPECIAL H	O	H	Special mode (still, cue, etc) indication signal.
55	SKEW SW 2	-	-	-
56	SKEW SW 1	-	-	-
57	2H DELAY SW	O	H	2H delay circuit control signal.
58	ALARM RESET IN	I	H	Alarm reset control signal input.
59	CFG1	I	-	Capstan FG1 pulse input.
60	CFG2	I	-	Capstan FG2 pulse input.
61	POWER DOWN	I	L	Power failure detection terminal.
62	ENV SW	I	-	Output comparison signal for main head and sub head.
63	AD MUTE	O	H	Signal disable audio signal output.
64	EXT TIMER IN	I	H	Timer recording during H input.
65	ALARM /1 SHOT IN	O	H	Alarm / 1 shot-rec signal input.
66	SERIES REC / EJECT IN	I	H	Signal to start series recording. Tape eject control signal input.
67	REC 12V DET	-	-	-
68	FLSTART + SAFETY	I	L	Switch input indicating start of cassette loading or discharge by cassette mechanism and detecting accidental erasure prevention tab of cassette tape.
69	AVdd	-	-	Power supply for analog circuitry.
70	AVREF	-	-	Reference voltage for analog circuitry.
71	SWDATA 2	I	H	Input of the three-bit signal that indicates mechanism operational position. (Please refer to the mechanism manual about the relation between mechanism position and switch data.)
72	SWDATA 1	I	H	
73	SWDATA 0	I	L	
74	T END S	I	L	Sensor signal input for tape end detection.
75	T TOP S	I	L	Sensor signal input for tape top detection.
76	DEW S	I	H	Dew sensor input pin.
77	REMOTE	I	-	Remote control signal (voltage) input.
78	REMOTE REF	-	-	Reference voltage for remote control signal.
79	VD ENV	I	-	Video head envelope detection signal input for ATR function.
80	N.C.	-	-	-
81	N.C.	-	-	-
82	DC LEVEL IN	-	-	-
83	AVss	-	-	Ground for analog circuitry.
84	CTL SLOPE	-	-	-
85	CTL HEAD +	I/O	H	Control pulse I/O.
86	CTL HEAD -	I/O	H	Control pulse I/O.
87	CTL IN	-	-	Control amp feed back filter.
88	CTL SIG OUT	O	-	Control amp out.
89	CTL AMP IN	I	-	Input signal from control amp.
90	Vref	-	-	Reference voltage for servo circuitry.
91	AVss1	-	-	Ground.
92	AVdd1	-	-	IC power source for analog circuitry.
93	CFG IN	I	-	Capstan motor FG pulse input.
94	CFG SIG OUT	-	-	-
95	CFG AMP IN	-	-	-
96	DPG IN	I	-	Head drum PG pulse input. (Used in servo control and generate the switching pulse.)
97	DFG IN	I	-	Head drum FG pulse input. (For drum servo)
98	S REEL P	I	-	Supply reel moving sensor input.
99	T REEL P	I	-	Take up reel moving sensor input.
100	C SYNC	I	-	Composite synchronizing signal input.

RF4QRNASY_IC301

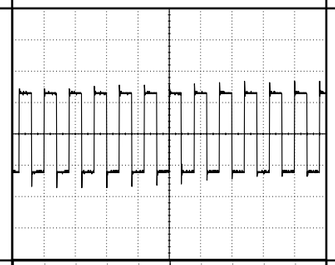
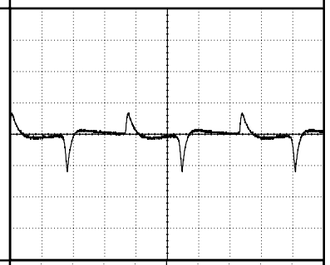
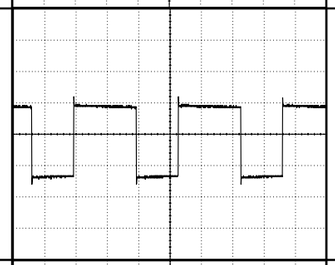
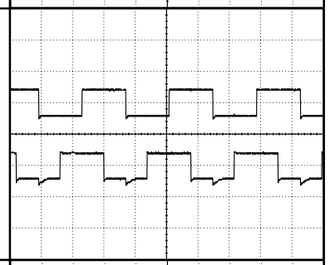
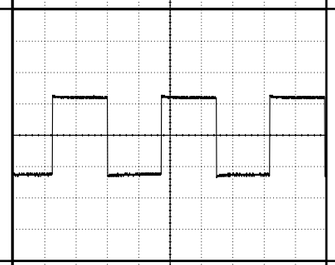
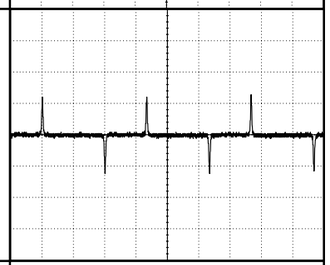
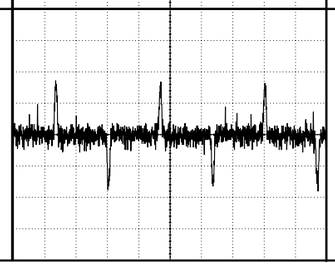
CP-1 Board (SY-A)

System Control & Servo



A B C D E F G H

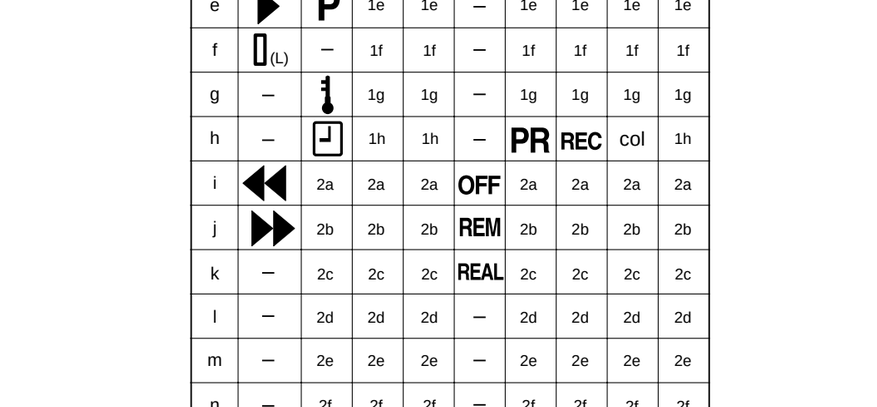
Servo Circuit Waveforms

TEST POINT LOCATION	WAVEFORM	TEST POINT LOCATION	WAVEFORM
IC301 PIN 9,10 REC 2V/div. 20µs/div.		IC301 PIN 98, 99 REC 2V/div. 500ms/div.	
IC301 PIN 85 REC 2V/div. 10ms/div.		IC304 UP : PIN 23 LOW :PIN 18 REC 5V/div. 500µs/div.	
IC301 PIN 93 REC 2V/div. 200µs/div.		IC301 PIN 89 PB 1V/div. 10ms/div.	
IC301 PIN 96 REC 100mV/div. 10ms/div.			

WF-S-EC4Q

Display (FLD) Grid/Anode Assignment Drawing & Table

GRID ASSIGNMENT

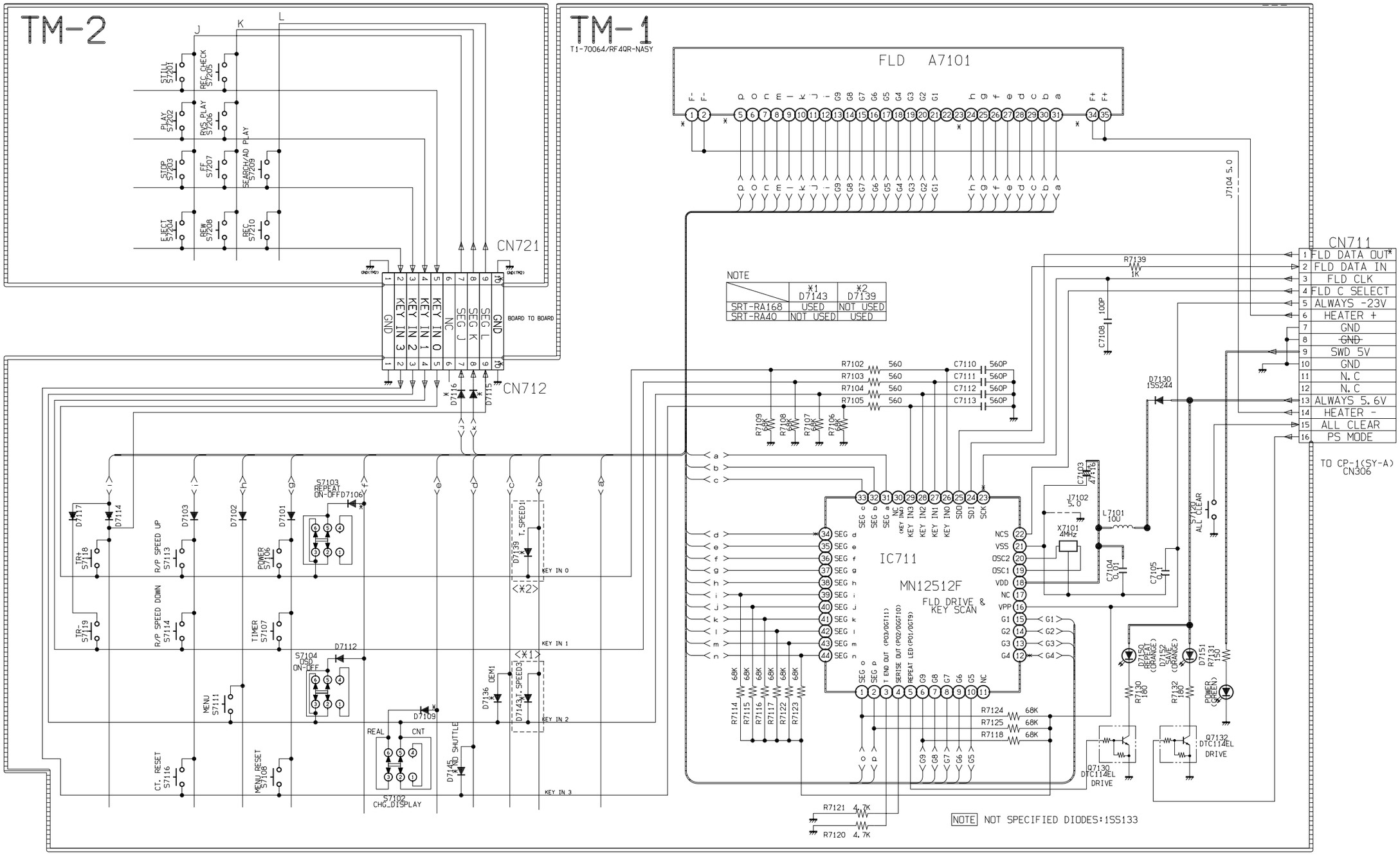


ANODE CONNECTION

	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	○	⊙⊙	1a	1a	P	1a	1a	1a	1a
b	▷	L	1b	1b	AL	1b	1b	1b	1b
c	◀	E	1c	1c	T/D	1c	1c	1c	1c
d	(R) ▯	S	1d	1d	EXT	1d	1d	1d	1d
e	▶	P	1e	1e	–	1e	1e	1e	1e
f	▯ (L)	–	1f	1f	–	1f	1f	1f	1f
g	–	🌡	1g	1g	–	1g	1g	1g	1g
h	–	⌟	1h	1h	–	PR	REC	col	1h
i	◀◀	2a	2a	2a	OFF	2a	2a	2a	2a
j	▶▶	2b	2b	2b	REM	2b	2b	2b	2b
k	–	2c	2c	2c	REAL	2c	2c	2c	2c
l	–	2d	2d	2d	–	2d	2d	2d	2d
m	–	2e	2e	2e	–	2e	2e	2e	2e
n	–	2f	2f	2f	–	2f	2f	2f	2f
o	–	2g	2g	2g	–	2g	2g	2g	2g
p	S VHS	SUB	M	H	–	–	M	–	S

GR-05000

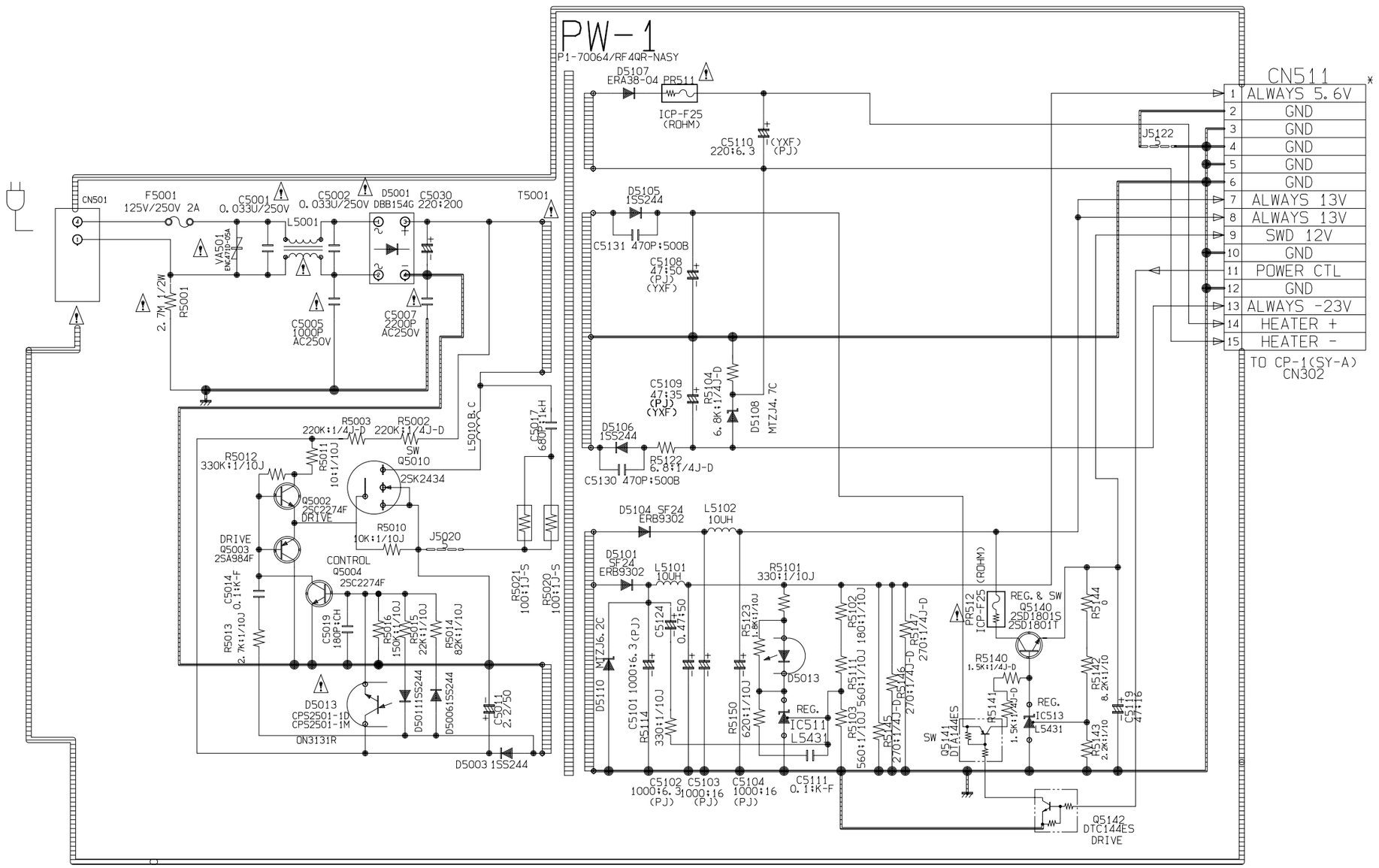
TM-1, TM-2 Board
Display & Key Scan



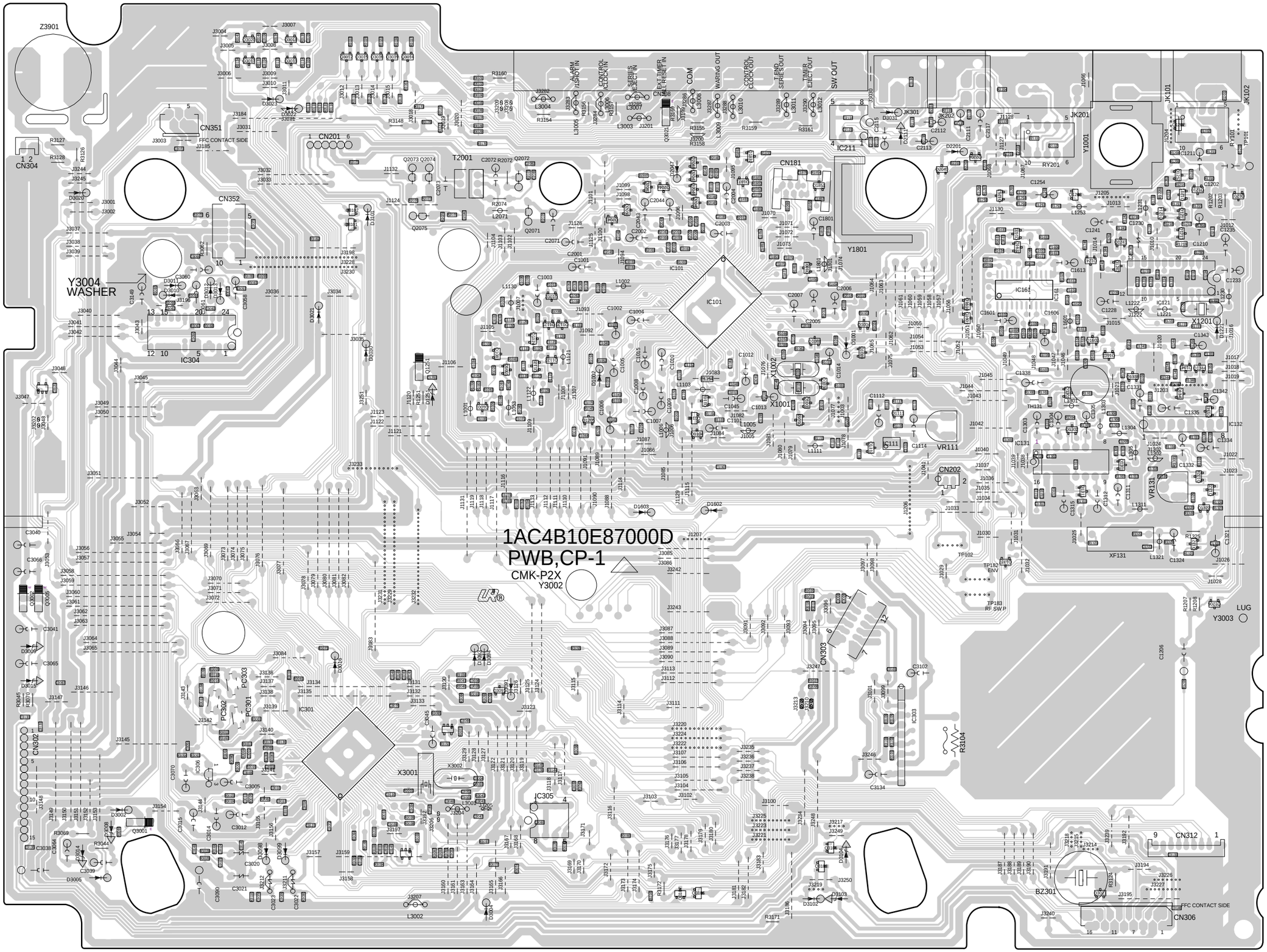
NOTE	※1 D7143	※2 D7139
SRT-RA168	USED	NOT USED
SRT-RA40	NOT USED	USED

CN711	
1	FLD DATA OUT
2	FLD DATA IN
3	FLD CLK
4	FLD C SELECT
5	ALWAYS -23V
6	HEATER +
7	GND
8	GND
9	SWD 5V
10	GND
11	N. C
12	N. C
13	ALWAYS 5.6V
14	HEATER -
15	ALL CLEAR
16	PS MODE

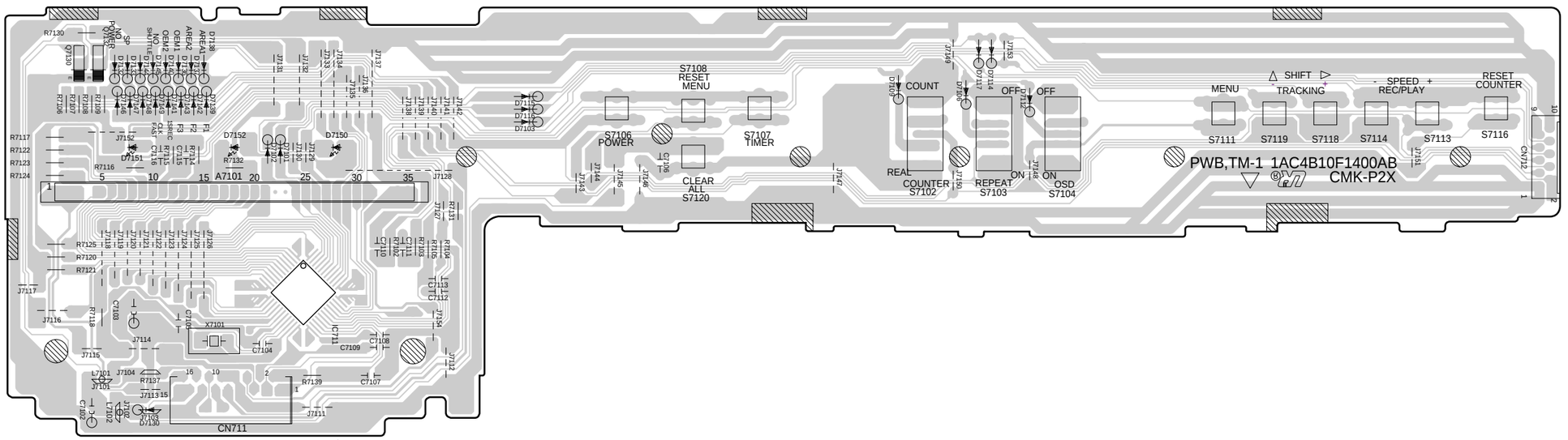
PW-1 Board
Power Supply



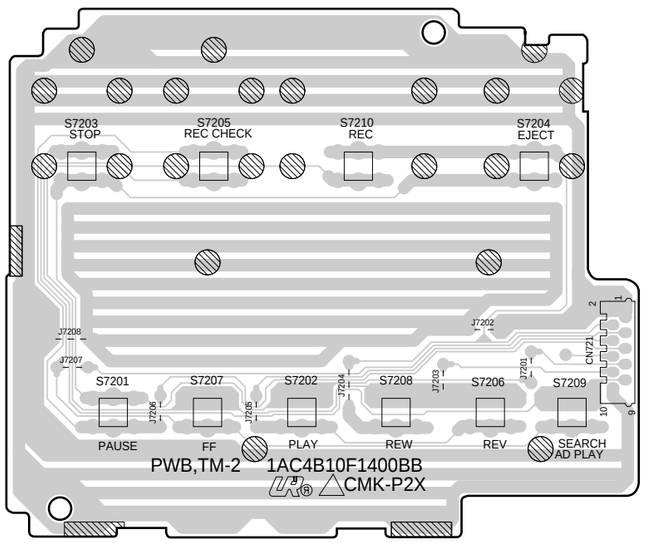
CP-1 Board


1AC4B10E87000D
PWB,CP-1
CMK-P2X
Y3002
Y3004
WASHER
Y3003
LUG
CN351
FFC CONTACT SIDE
CN352
CN304
CN181
CN202
CN303
CN312
CN306
FFC CONTACT SIDE
IC101
IC211
IC161
IC304
IC301
IC303
JC305
Y1801
X1001
X1002
X3001
X1201
Y1001
RY201
JK101
JK102
JK201
JK301
JK202
VR111
VR131
XF131
BZ301
TH131
R3104
LOADING
CONTROL
CLOCK IN
SERIES
DETECTION
EXT TIMER
RESET IN
COM
WARING OUT
CONTROL
CLOCK OUT
TEND
SERIES OUT
TIMER
EJECT OUT
SW OUT
ALARM
LASH IN

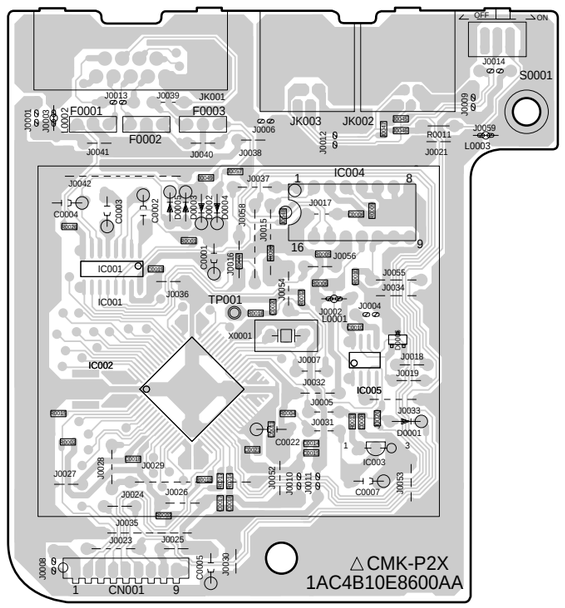
TM-1 Board



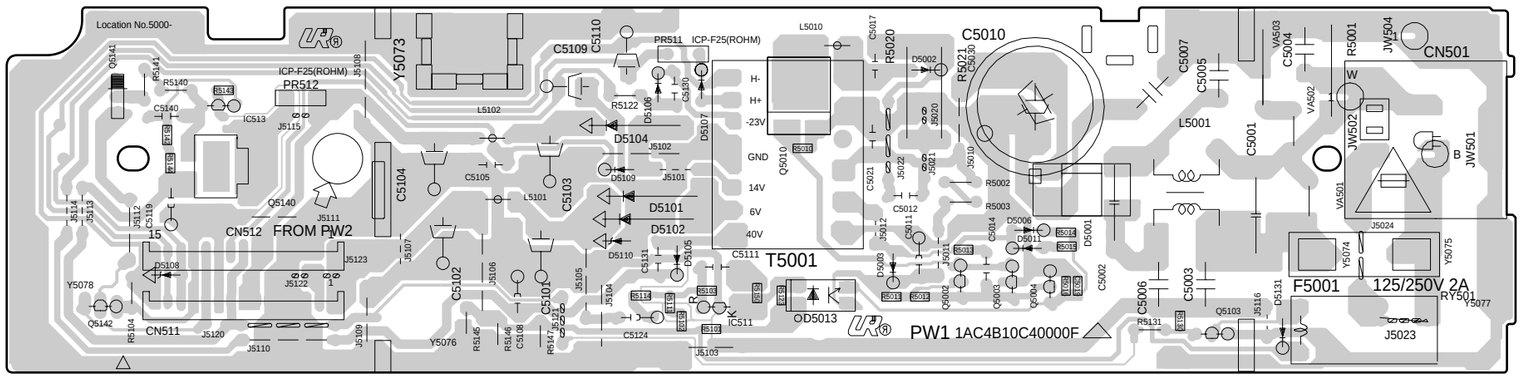
TM-2 Board



CT-1 Board (Option Board for SVT-RS100)



PW-1 Board


Location No.5000-
PW1 1AC4B10C40000F
CN501
CN511
CN512 FROM PW2
T5001
F5001
125/250V 2A
PR511 ICP-F25(ROHM)
PR512 ICP-F25(ROHM)
H-
H+
-23V
GND
14V
6V
40V
C5010
L5001
L5010
IC511
IC513
OD5013
D5101
D5102
D5104
J5023
J5024

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

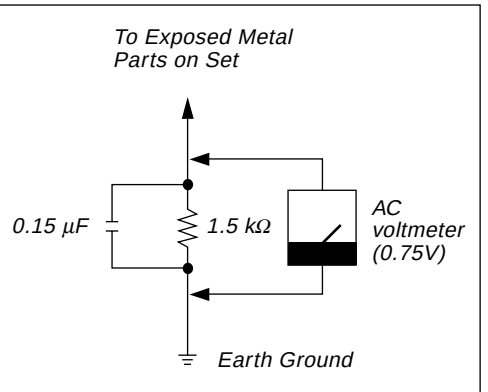


Fig A. Using an AC voltmeter to check AC leakage.

SVT-RA40 (UC)
SVT-RA168 (UC) E
9-955-359-01

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